

CANADIAN THESES ON MICROFICHE

THÈSES CANADIENNES SUR MICROFICHE



National Library of Canada
Collections Development Branch

Canadian Theses on
Microfiche Service

Ottawa, Canada
K1A 0N4

Bibliothèque nationale du Canada
Direction du développement des collections

Service des thèses canadiennes
sur microfiche

NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30. Please read the authorization forms which accompany this thesis.

AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30. Veuillez prendre connaissance des formules d'autorisation qui accompagnent cette thèse.

**THIS DISSERTATION
HAS BEEN MICROFILMED
EXACTLY AS RECEIVED**

**LA THÈSE A ÉTÉ
MICROFILMÉE TELLE QUE
NOUS L'AVONS REÇUE**

Canada



National Library
of Canada

Bibliothèque nationale
du Canada

Ottawa, Canada
K1A 0N4

TC -

ISBN 0-315-21245-4

CANADIAN THESES ON MICROFICHE SERVICE - SERVICE DES THÈSES CANADIENNES SUR MICROFICHE

PERMISSION TO MICROFILM - AUTORISATION DE MICROFILMER

• Please print or type - Écrire en lettres, moulées ou dactylographier

AUTHOR - AUTEUR

Full Name of Author - Nom complet de l'auteur

BUSE, GEORGE B.

Date of Birth - Date de naissance

29/01/51

Canadian Citizen - Citoyen canadien

☒ Yes / Oui

☐ No / Non

Country of Birth - Lieu de naissance

CANADA

Permanent Address - Résidence fixe

18132-68 Ave
Edmonton, Alberta

THESIS - THÈSE

Title of Thesis - Titre de la thèse

The Growth and Development of Single-Enterprise
Communities: The Cases of Yellowknife and
Whitehorse.

Degree for which thesis was presented
Grade pour lequel cette thèse fut présentée

MASTER OF ARTS

Year this degree conferred
Année d'obtention de ce grade

1985

University - Université

University of Alberta

Name of Supervisor - Nom du directeur de thèse

D. Johnson

AUTHORIZATION - AUTORISATION

Permission is hereby granted to the NATIONAL LIBRARY OF CANADA to
microfilm this thesis and to lend or sell copies of the film.

The author reserves other publication rights, and neither the thesis nor exten-
sive extracts from it may be printed or otherwise reproduced without the
author's written permission.

L'autorisation est, par la présente, accordée à la BIBLIOTHÈQUE NATIONALE
DU CANADA de microfilmer cette thèse et de prêter ou de vendre des ex-
emplaires du film.

L'auteur se réserve les autres droits de publication; ni la thèse ni de longs ex-
traits de celle-ci ne doivent être imprimés ou autrement reproduits sans
l'autorisation écrite de l'auteur.

ATTACH FORM TO THESIS - VEUILLEZ JOINDRE CE FORMULAIRE À LA THÈSE

Signature

Date

6-Feb-85

NL-91 (r. 84/03)

Canada

THE UNIVERSITY OF ALBERTA

THE GROWTH AND DEVELOPMENT OF SINGLE-ENTERPRISE COMMUNITIES:
THE CASES OF YELLOWKNIFE AND WHITEHORSE .

by



GEORGE BUSE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF ARTS

DEPARTMENT OF GEOGRAPHY

EDMONTON, ALBERTA

SPRING 1985

2

THE UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR GEORGE BUSE
TITLE OF THESIS THE GROWTH AND DEVELOPMENT OF
 SINGLE-ENTERPRISE COMMUNITIES: THE CASES
 OF YELLOWKNIFE AND WHITEHORSE
DEGREE FOR WHICH THESIS WAS PRESENTED MASTER OF ARTS
YEAR THIS DEGREE GRANTED SPRING 1985

Permission is hereby granted to THE UNIVERSITY OF ALBERTA LIBRARY to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific research purposes only.

The author reserves other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

(SIGNED)

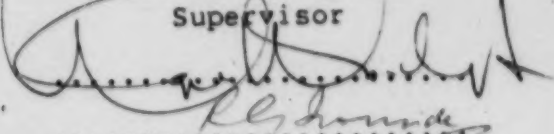
PERMANENT ADDRESS:

..... 18132-68 Ave
..... Edmonton, Alberta
.....

DATED 20 Jan 1985

THE UNIVERSITY OF ALBERTA
FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled THE GROWTH AND DEVELOPMENT OF SINGLE-ENTERPRISE COMMUNITIES: THE CASES OF YELLOWKNIFE AND WHITEHORSE submitted by GEORGE BUSE in partial fulfilment of the requirements for the degree of MASTER OF ARTS.


.....
Supervisor

.....
Reader

Date..... 7/22/1985

ABSTRACT

Single-enterprise communities because of their perceived social problems, have been studied primarily by sociologists. Over the past five years, a new philosophy has emerged which suggests that these communities are not merely short term bunk camps, but are a viable part of the settlement frontier. Part of this philosophy also recognizes that in order to make these northern areas viable, there must be a greater awareness of the quality of life in these communities.

This thesis examines a model of single-enterprise development from an urban geographic perspective. The model, developed by J.A. Riffel, takes into account the fact that single-enterprise communities go through distinctive stages in urban development, each stage having unique social, demographic, and economic conditions. This study examines the model by utilizing two case studies to verify the existence of stages in the growth and development of single-enterprise communities.

The study examines the communities of Yellowknife and Whitehorse, and includes several other single-enterprise communities to exemplify various stages of the model. These investigations provide the basis for a new model of single-enterprise community development.

ACKNOWLEDGEMENTS

I am deeply grateful to my thesis supervisor for his perserverence and belief in my ability to complete this thesis. During the data collection phase of this study, Dr. Wayne McVey provided both encouragement and valuable criticism. Dr. McVey was instrumental in the review of many drafts of this thesis. I am also indebted to the third committee member, Dr. Geoffrey Ironside, for his critical review of both the thesis and the thesis proposal.

Linda Abbott diligently and patiently typed the many drafts of this manuscript. My wife and family, whose support brought me to this point, must also be recognized. I would like to thank the Boreal Institute for Northern Studies, for providing a grant to collect the necessary information. I am indebted to the Government of Alberta which allowed me two months of education leave to complete this thesis.

But most importantly, I would like to thank my father, Gustav R. Buse, without whose continual insistence that education is important, this work would never have been completed.

Chapter	Table of Contents	Page
ABSTRACT		iv
ACKNOWLEDGEMENTS		v
LIST OF TABLES		ix
LIST OF FIGURES		xi
I. INTRODUCTION		1
II. LITERATURE REVIEW		8
A. INTRODUCTION		8
B. SINGLE-ENTERPRISE COMMUNITY DEVELOPMENT		8
C. STUDIES EMPHASIZING CLASSIFICATION AND TYPOLOGY		10
D. STUDIES EMPHASIZING QUALITY OF LIFE AND MOBILITY		14
E. MODELS AND GEOGRAPHY		18
F. THE DEVELOPMENT MODEL		25
G. CRITICAL EVALUATION OF RIFFEL'S MODEL		35
H. SUMMARY		41
III. METHODOLOGY		42
A. STUDY OBJECTIVES		42
B. MODELS AND AN INDICATORS APPROACH		43
C. SELECTION OF THE COMMUNITIES		45
D. DATA SOURCES		47
E. SELECTION OF INDICATORS		50
F. LIMITATIONS		56
IV. ECONOMIC CHARACTERISTICS OF SINGLE-ENTERPRISE TOWN DEVELOPMENT		58
A. INTRODUCTION		58
B. YELLOWKNIFE: ECONOMIC CHARACTERISTICS OF DEVELOPMENT		59

C.	WHITEHORSE: ECONOMIC CHARACTERISTICS OF DEVELOPMENT	69
D.	ECONOMIC CHARACTERISTICS OF SINGLE-ENTERPRISE COMMUNITIES DURING DEVELOPMENT	78
E.	CONCLUSION	96
V.	DEMOGRAPHIC CHARACTERISTICS OF SINGLE-ENTERPRISE TOWN DEVELOPMENT	99
A.	INTRODUCTION	99
B.	YELLOWKNIFE: DEMOGRAPHIC CHARACTERISTICS OF DEVELOPMENT	99
C.	WHITEHORSE: DEMOGRAPHIC CHARACTERISTICS OF DEVELOPMENT	106
D.	DEMOGRAPHIC CHARACTERISTICS OF DEVELOPMENT ...	112
E.	CONCLUSION	154
VI.	SOCIAL CHARACTERISTICS OF SINGLE-ENTERPRISE TOWN DEVELOPMENT	156
A.	INTRODUCTION	156
B.	YELLOWKNIFE: SOCIAL CHARACTERISTICS OF DEVELOPMENT	158
C.	WHITEHORSE: SOCIAL CHARACTERISTICS OF DEVELOPMENT	164
D.	SOCIAL GEOGRAPHY OF SINGLE-ENTERPRISE COMMUNITIES	168
	INDUSTRIAL OPERATION AND COMMUNITY IMPROVEMENT	169
	INDUSTRIAL AND COMMUNITY OPERATION	182
	COMMUNITY DIVERSIFICATION	190
E.	CONCLUSION	204
VII.	SINGLE-ENTERPRISE COMMUNITIES: A REVISED MODEL OF DEVELOPMENT	207
A.	INTRODUCTION	207
B.	RESEARCH FINDINGS	210

C. ECONOMIC CHARACTERISTICS OF THE FOUR STAGE MODEL	214
D. DEMOGRAPHIC CHARACTERISTICS OF THE FOUR STAGE MODEL	216
E. SOCIAL CHARACTERISTICS OF THE FOUR STAGE MODEL	218
F. GEOGRAPHIC CHARACTERISTICS OF THE FOUR STAGE MODEL	219
G. FUTURE RESEARCH	221
VIII. BIBLIOGRAPHY	224
APPENDIX	238

LIST OF TABLES

Table	Page
1 Labour Force Comprising the Gainfully Employed Ten Years of Age and Over by Industry & Occupation, for the Northwest Territories: 1931	80
2 Labour Force by Industry, Fort McMurray: 1977-1980.....	84
3 Labour Force by Industry, Yellowknife: 1951 and 1962.....	89
4 Labour Force of Whitehorse: 1961 and 1971 and for Yellowknife: 1971.....	91
5 Labour Force Activity by Industry, Yellowknife, Whitehorse and Grande Prairie: 1971..	95
6 Age and Sex Distribution for Northwest Territories: 1921 and 1931.....	114
7 Age-Sex Distribution, Fort McMurray: 1966 and 1976.....	118
8 Sex Ratios for Selected Single-Enterprise Communities: 1951-1976.....	121
9 Marital Status of Fort McMurray, Whitehorse and Yellowknife: 1951-1976	124
10 Sex Ratios of Single Population Age 15 and Over Fort McMurray, Whitehorse and Yellowknife: 1951-1971	126
11 Age and Sex Distribution, Fort McMurray: 1971 and 1979.....	128

12	Population Growth Rate, Stage V, Fort McMurray: 1951, 1961, Yellowknife: 1951-1966, Whitehorse: 1911-1941.....	138
13	Age and Sex Distribution During Stage V, for Yellowknife: 1951-1966, Whitehorse: 1951, Fort McMurray: 1961	139
14	Life Cycle Stages of Study Communities in Stage V of Development: 1951-1966	142
15	Modern Single-Enterprise Communities Compared to Earlier Single-Enterprise Communities	144
16	Migration Status, Fort McMurray, Yellowknife, Whitehorse, Grande Cache, Camrose and Grande Prairie: 1971-1976	147
17	Age and Sex Distribution Stage VI, Yellowknife: 1971-1976 and Whitehorse: 1961-1976	149
18	Indices of Dissimilarity for Communities in Stage V and VI.....	152
19	Summary of Revised Stages and Characteristics of Single-Enterprise Town Development.....	214
20	Selected Social Statistics, Fort McMurray: 1971..	239
21	Selected Social Statistics, Grande Cache: 1971...	240
22	Selected Social Statistics, Yellowknife: 1971....	241
23	Selected Social Statistics, Whitehorse: 1971.....	242

LIST OF FIGURES

Figure		Page
1	Northern Ecumene	4
2	Stages and Characteristics of Resource Town Development	27
3	Study Communities and Development Stages	47
4	Labour Force Participation by Industry During Development Stages	97
5	Age-Sex Structure, Stage I of Development, Northwest Territories 1921 and 1931	115
6	Age-Sex Structure, Stage III of Development, Fort McMurray 1966 and 1976	119
7	Age-Sex Structure, Stage IV, Fort McMurray 1971 and 1979 Compared With Stage III, Fort McMurray 1976	129
8	Age Structure, Canadian New Town, Mill Woods, Compared to Stage IV and V Single-Enterprise Communities	131
9	Age-Sex Structure, Whitehorse 1951, Yellowknife 1951-1966	141
10	Enumeration Areas, Fort McMurray: 1971	170
11	Distribution of Managerial, Professional and Technical Occupations: Fort McMurray, 1971	171
12	Distribution of Processing and Related Occupations: Fort McMurray, 1971	173

13	Distribution of Sales, Services and Clerical Occupations: Fort McMurray, 1971	175
14	Distribution of Transportation and Communication Occupations: Fort McMurray, 1971	176
15	Distribution of Income: Fort McMurray, 1971	178
16	Distribution of Owner-Occupied Housing: Fort McMurray, 1971	179
17	Enumeration Areas, Grande Cache: 1971	183
18	Distribution of Managerial, Professional and Technical Occupations: Grande Cache, 1971	184
19	Distribution of Processing and Related Occupations: Grande Cache, 1971	185
20	Distribution of Sales, Services, and Clerical Occupations: Grande Cache, 1971	186
21	Distribution of Income: Grande Cache, 1971	188
22	Distribution of Owner-Occupied Housing: Grande Cache, 1971	189
23	Enumeration Areas, Yellowknife: 1971	192
24	Distribution of Managerial, Professional and Technical Occupations: Yellowknife, 1971	193
25	Distribution of Income: Yellowknife, 1971	195
26	Distribution of Population of Native Heritage: Yellowknife, 1971	197

27	Distribution of United Church Supporters: Yellowknife, 1971	199
28	Enumeration Areas, Whitehorse: 1971	200
29	Distribution of Managerial, Professional and Technical Occupations: Whitehorse, 1971	201
30	Distribution of Income: Whitehorse, 1971	202

I. INTRODUCTION

Canada as a relatively new state is still experiencing settlement in its frontier areas. These frontier areas can be thought of as one distinctive type of ecumene or inhabited region. Canada as a whole has been described in terms of four types of ecumene, each having distinctive population, settlement and economic characteristics. (Putnam and Putnam, 1970, 6) and (Gertler and Crowley, 1976, 256)

The concept of ecumene, used by geographers to mean inhabited land, or inhabited space, was applied to Canada as early as 1960 by Roman Gajda. Most maps of Canadian ecumene are based on Gajda's paper of 1960 "The Canadian Ecumene - Inhabited and Uninhabited Areas." Gajda (1960) suggested that the Canadian ecumene consists of five zones. Hamelin (1966) revised the terminology used to describe these five zones and suggested that a water ecumene could also be added to this classification scheme.

Hamelin (1978) in reviewing the concept of Canadian nordicity, defined as "...the state of level of being polar in the Northern Hemisphere", suggested a more appropriate zonation of Northern Canadian ecumene would consist of four zones. The Extreme North, the Far North, the Middle North, and the Near North. (Hamelin, 1978, 70-84). The three sets of terminology basically refer to the same zones and are as follows:

	Gajda 1960	Hamelin 1966	Hamelin 1978
Zone 1	Intensive	Bloc	Near North
Zone 2	Extensive	Broken	Near North
Zone 3	Exploitation	Pioneer Fringe	Middle North
Zone 4	Sporadic	Sporadic	Far North
Zone 5	Non-ecumene	Unattractive or Repulsive	Extreme North

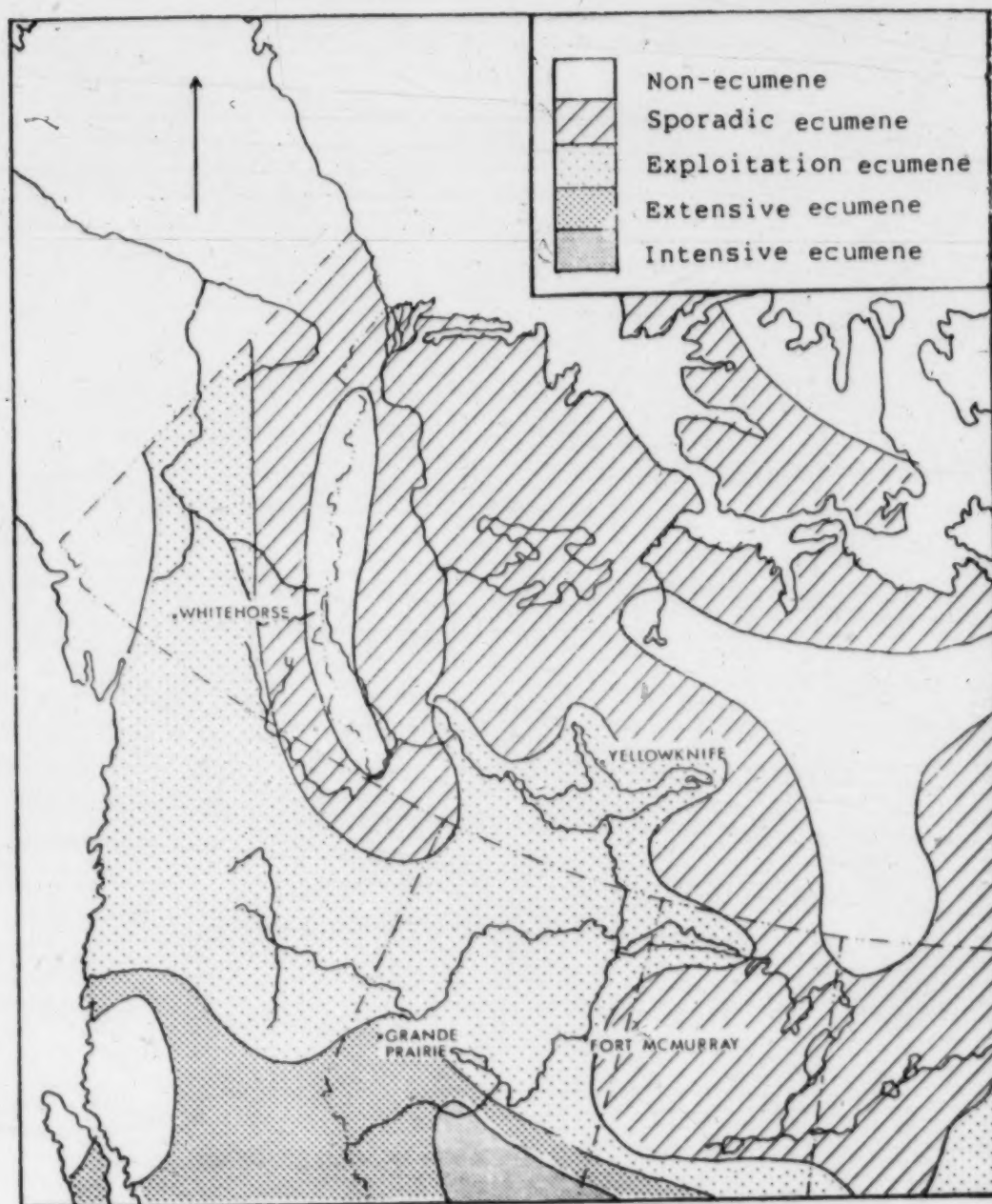
Hamelin basically collapsed Zone 1 and 2 into the category called "the Near North and Core Ecumene" Zone 3 corresponds roughly to the Middle North, the Far North corresponds to Zone 4 the sporadic ecumene and the Extreme North corresponds to the Non-ecumene. Because Hamelin utilized an averaging technique for his 1978 map, the Middle, Far and Extreme North are more regular and less detailed than either Gajda or Hamelin's earlier maps. Hamelin identified a minimum of eleven areas which are anomalies within his classification scheme. These anomalies point to a serious methodological shortcoming in Hamelin's work as any classification scheme must follow its criteria once they are set.

Due to this shortcoming Gajda's original concept of ecumene will be utilized in this thesis. It should be noted that Hamelin's concept of denordification is recognized as a

potentially valuable concept and the model which will be investigated in this thesis fits within the concept of denordification or changing the relative nordicity of given locations.

Gajda's core ecumene consists of a narrow belt of densely settled area close to the U.S. border. (See Figure 1) This intensive ecumene has a wide variety of communities of differing population size, an extremely productive agriculture base and a wide variety of employment and occupational choice. Zone 2 and 3, which are the areas of ecumene with which this thesis is concerned, are both resource based areas. Zone 2, sometimes referred to as the extensive ecumene, or more recently resource exploitation zone, is settled according to the distribution of resources. Arable land is found in widely dispersed areas and the communities are most often the result of a single industrial enterprise. Zone 3, the sporadic ecumene, is characterized by the same features as Zone 2 but virtually no agricultural potential exists. Zone 4, the non-ecumene, consists of the high Canadian Arctic, and encompasses the most northerly parts of Canada.

Zone 2 and 3 are unique due to the single-enterprise economic base of the communities, but are also distinctive because the location of resources in these regions requires that completely new towns be built to house the labour force. (Pressman, 1974, 79) Although the extension of settlement into these areas is haphazard and widely



Adapted from Gajda 1960

Figure 1
Northern Ecumene

dispersed, emphasis is shifting from concern for the individual community as an entity unto itself to a concern for broader regional patterns.

The involvement of government has seen a shift to settlement and development programs with a regional emphasis. Pressman, (1974) and Riffel, (1975) identify that this shift in emphasis has brought with it a demand in these settlements and regions for an improved quality of life. This emphatic expression of whites and natives for improved living quality is evident in single-enterprise communities where residents demand single-family housing at subsidized rates before committing to move to these communities. (Riffel, 1975, 18)

It is most likely that the quality of life issue has come to the forefront in these communities for two reasons. Firstly, the quality of life in these communities in the pre-1970's has been perceived as being particularly low. It should be noted that this thesis does not deal specifically with quality of life issues. Quality of life is mentioned here only because quality of life was a catalyst for Riffel to develop the model under consideration.

The second and perhaps more important trend has been the societal shift identified by W.W. Rostow (1960). As Canadian society evolved it has moved through four stages of growth, each with a unique ethic. The movement from pre-industrial with subsistence as its guiding ethic through industrial growth with production as the guiding more, to a

mass consumption stage guided by predominantly consumption and growth and finally to the post-industrial society, where quality of life has become the primary guiding moral principle. With the increased technological requirements of resource extraction, the specialization of the labour force and greater awareness of issues such as quality of life; industry can no longer dictate the living conditions of its employees in these northern frontier regions.

The quality of life in single-enterprise communities is therefore a current issue which has impact upon the settlement of the Canadian north and the potential for planning urban complexes with new economic, demographic and social structures. Before these futuristic urban communities can be planned there is a requirement for a greater understanding of single-enterprise communities and the development process through which they pass. These communities can no longer be thought of as monolithic, static fixtures in isolated areas but must be considered as dynamic, evolving parts of a regional settlement pattern.

This thesis examines single-enterprise communities from this new philosophical perspective: denordification. This thesis attempts to provide evidence of the dynamic nature of single-enterprise communities by providing quantifiable evidence of the evolution of single-enterprise communities through distinctive economic, demographic and social stages of development. Although the model, which will be presented later, refers specifically to resource town development it

will be expanded to include all types of single-enterprise communities, because resource communities are but one type of single-enterprise community. (Institute of Local Government, 1953, iii)

As this is the first attempt to quantify this urban model, the economic, demographic and social characteristics will be examined independently to determine if the seven development stages hypothesized by the model have distinguishable economic, demographic and social characteristics.

Although the basic objective of this study is to identify changes in demographic, economic and social characteristics related to urban development, the study holds implications for single-enterprise communities and the future of these communities in the region. The interrelationships of communities in regions, which are spatial phenomena, cannot be understood without first examining the dynamic growth and development of these urban communities. Without understanding the changes occurring during urban development, regional planning and development are not only impractical, but are virtually impossible.

II. LITERATURE REVIEW

A. INTRODUCTION

This chapter provides a theoretical framework for this thesis. The literature review touches upon existing single-enterprise community studies, a more philosophical discussion of models in general and a more detailed description and critique of the model being tested in this thesis.

B. SINGLE-ENTERPRISE COMMUNITY DEVELOPMENT

Popularly considered to be 'researched to death', Siemens points out that: "From a search of the literature one quickly notes that most of what has been written about Canada's single-enterprise communities has been of a popular rather than a scientific nature." (Siemens, 1973, 1) The romance of frontier areas has been largely responsible for the popular slant on these studies. But a new interest in the character of these communities has come from the realization that they are to be a permanent feature of our national life. "Hitherto, they were often regarded as temporary settlements, as lumber and mining camps which could be abandoned as the resources were consumed." (The Institute of Local Government, 1953, 1)

The single-enterprise community, as distinct from the resource community, the new town, or the planned community is described best by the Institute of Local Government.

These are communities which have come into being by reason of the decision or action of a single-enterprise, be it an industry, a government agency, a defense establishment or a transportation system. Neither the long accepted term 'company town', with its unfortunate connotation, nor the more recent term 'new town', which has a specialized meaning seems to meet the need adequately. (The Institute of Local Government, 1953, iii)

This is not to say a single-enterprise community cannot be a new town, a resource community or a planned community. The term single-enterprise is used here to be inclusive of resource communities. Since new towns are a planning tool, they are normally comprehensively planned, are used to accomodate rapid population growth, and also have the sanction and support of the government. Single-enterprise communities, therefore, need not be planned nor be new towns. In the majority of cases resource communities are new towns by virtue of their remote location and rapid growth.

The Institute of Local Government (1953) study Single Enterprise Communities in Canada, was one of the first comprehensive studies of single-enterprise communities. The study identified 175 single-enterprise communities with a population totaling in excess of 189,000. Although the study was oriented towards the planner and policy maker, there was a recognition of the complex nature of these communities. This early study, despite its emphasis on planning, policy and administration, recognized that these types of communities had social needs.

C. STUDIES EMPHASIZING CLASSIFICATION AND TYPOLOGY

Nine years later the next major study of single-enterprise communities appeared. Robinson (1963), studying Kitimat, Drayton Valley, Elliot Lake, and Schefferville, was more concerned with the physical layout than the social problems of these communities. Dealing only with one type of single-enterprise community, the industrial new town, Robinson presented a discussion of the problems with life in these new towns. Robinson used historical development to devise a typology of resource communities. Three distinct types of communities were described.

The first type was resource towns which consisted of bunk or tent camps, limited to providing room and board to the workers engaged in extracting the resource. Once the resource was exhausted these communities were either abandoned or if they were portable enough they were simply moved to the site of new unexploited resources. These camps consisted of a cookhouse, bunk houses and tents. (Robinson, 1963, 4)

The second type of resource town which evolved was the company town. This type of resource town was owned and controlled by the parent company. Not only were the resources owned by the parent company but the housing, stores and all available services were owned and controlled by the single-enterprise sponsor. Much of the negative criticism of company towns has been on the basis of company control of the employee's non-work hours. (Robinson, 1963,

5)

The third type of resource town to appear in Canada was the comprehensively planned new town. Robinson, (1963) and Lucas, (1971), both agree that this type of resource community was brought about by several developments, including the advance of technology, the negative connotations of the company town, and the tremendous financial investment required to build the industrial plant and community.

Concomitant to improved technology was a need for skilled, highly qualified manpower. Typically middle-class, this labour force brought with it a strong family orientation and middle-class expectations and mores. It has become imperative that these communities provide facilities and services conducive to modern family life. This skilled labour force demanded higher order services if they were to be permanent residents of these communities. This change in the type of labour force required to extract resources, has created demands for urban services and institutions more typically found in the core of Canada's ecumene.

Shaw (1970) classified resource communities as either planned or unplanned communities. Studying the differences between planned and unplanned communities, Shaw found no evidence to suggest the planned community was a better place to live. Shaw's (1970) study was the first study of single-enterprise communities that presented a detailed analysis of the demographic characteristics of these

communities. Shaw dealt specifically with resource communities, a particular kind of single-enterprise community.

Although Shaw's study failed to prove that planning a community made it a better place to live, it did recognize that modern resource communities have changed. The modern single-enterprise communities are planned communities. This change was a response to a number of factors. The negative image of the company town, the drain on corporate finances required to build the community, and the articulation of citizen demands for improved quality of life forced corporations to recognize the need for community planning.

Neither Robinson's (1962) historical development classification nor Shaw's (1970) planning dichotomy appear to completely satisfy the entire spectrum of single-enterprise development.

Lucas (1971) provided a comprehensive study of industrial towns from a sociological perspective. Minetown, Milltown, Railtown made three important contributions to the study of single-enterprise communities. First, the study articulated an argument that communities of single-enterprise were very similar to non-resource based communities with a population of less than 30,000. Second, Lucas incorporated into the literature some of the findings of classic American studies of single-enterprise communities. Third, Lucas (1971) provided a model of community development which emphasized the social aspects of

community development rather than the physical development. Lucas proposed a four stage model based on twenty years of comprehensive social study.

Stage I, construction of the community, was typified by mobile construction workers, immigrant newcomers, tradesmen, and get rich workers. Lucas (1971) stated these unstable construction groups were the first inhabitants of the single-enterprise communities. Some of the construction workers remained in the community when the permanent citizens arrived.

During the second stage, the recruitment of citizens, the single-enterprise company recruited employees from other parts of the company as well as outside the company. For a period of time the community experienced high mobility due to isolation, a lack of facilities, and the unmet expectations of single personnel and wives of married men. This transient population was generally very youthful. The other characteristic which became apparent during this stage was the ethnic affiliation of the immigrants. (Lucas, 1971, 69)

The transition stage was the transfer of community control from the company to the population. The responsibility for the management and administration was decentralized and diffused. The citizens assumed both responsibility and authority for the community.

Maturity, the fourth stage, was achieved with the passing of time. New interpersonal relationships developed,

mobility was significantly reduced, with older people retiring in the community while youth was forced to emigrate due to the stable labour force in the community.

The model which Lucas proposed is based on the demographic changes of a single-enterprise community. Lucas does not consider the possibility that some single-enterprise communities attract other industries and diversify the economic base. The model does not take into account that there may be a native population in the vicinity of this community, nor does the model present the impact which the single-enterprise has on the native culture and society. As Morrison (1977) points out, the native population experiences culture shock when the single-enterprise community intrudes into the native society.

D. STUDIES EMPHASIZING QUALITY OF LIFE AND MOBILITY

The first studies undertaken by the Center for Settlement Studies at the University of Manitoba were quality of life and mobility studies. Matthiasson (1970) examined resident perception of quality of life in Fort McMurray and also released a second study on resident mobility. Since the central theme of this thesis does not revolve about quality of life, studies emphasizing quality of life will only be mentioned as they relate to issues within the scope of this thesis.

Of the mobility studies published by the Center, two studies are significant: Matthiasson's "Resident Mobility in Resource Frontier Communities: An Examination of Selected Factors", and Jackson and Poushinsky's "Migration to Northern Mining Communities: Structural and Social-Psychological Dimensions". Matthiasson (1971) found that 77 per cent of respondents came to Fort McMurray because of employment opportunity. Sixty per cent of the sample also indicated employment as a primary reason for staying. Jackson and Poushinsky (1976) verified this finding when studying four Ontario mining communities. Respondents indicated they left their previous communities because there was little future in jobs held there.

Nickels, *Et al.* (1976) similarly concluded that the employment of the male head of the family was the primary determinant of migration to Lynn Lake, Manitoba. This study also revealed that the males' job satisfaction was the primary determinant of retention in the community. Porteus (1976) found three predominant reasons for moving to single-enterprise communities: 1) the drive to get rich quick; 2) the newcomers couldn't make it elsewhere; and 3) attempting to change to a new way of life.

Riffel (1975) integrated some of the literature on single-enterprise communities and explained the apparent inconsistencies in the literature. Lucas (1971), for example, states that the single-enterprise community is comprised of young married population, while Robinson (1962)

stated the resource community is predominantly male. Riffel states that the community is comprised of both elements. During the early construction stages the community is dominated by single men who migrate to the community in search of the 'fast buck'. The permanent work force, who do not appear in the community until the construction is mostly complete, are predominantly young married couples with young families.

Doyle (1976) examined four mature single-enterprise communities including Whitehorse. In these mature communities, over 75 per cent of the respondents were married and were born in Canada. Most of these families were nuclear and had some children. Almost half of the sample studied were recent movers within the community and had moved to the community within the last five years.

Mobility and migration are signs of population turnover. An associated economic variable is labour force turnover. Although they are not necessarily related in the case of single-enterprise communities, where employment is the predominant reason people come to the community, it is highly likely that labour turnover is strongly related to population turnover. The information on turnover is inconclusive. MacMillan *Et al.* (1974) found an 80 per cent labour turnover rate among 196 companies surveyed. A conflict of personal and company goals was recognized by Jackson and Poushinsky (1971) whose study identified the goal of the company as high profit, the goal of the

community to provide services and the goal of the individual to maximize achievement of individual values. The expectancy levels of each of these groups in goal attainment leads to conflicts and a need for compromise in the community, since the maximization of any one of these goals brings all these goals into conflict.

Morrison's (1977) study of Grande Cache presented an articulate argument that a number of stressors were at work in negatively affecting the population of the new town of Grande Cache. Morrison found the Metis population to be suffering from culture shock and a general animosity seemed to be at work between the various ethnic groups in the community. Drinking was not merely a recreational event but was a means to temporarily relieve the stress. (Morrison, 1977, 225)

Gartrell (1980), in his study of Fort McMurray described and analyzed the social and personal adjustment of the town people and found a highly mobile population, a high dependency ratio, a high proportion of married adults, and a relatively transient population. Gartrell found a high proportion of subsidized housing and very high intra-urban mobility. The research recorded some service delivery problems, notably in medical care and entertainment. With an average family income in excess of \$24,000 a year it is not surprising that the population expects better service delivery and demands local opportunities to spend their money.

Although the literature on single-enterprise communities is prolific there are a number of inherent problems with this type of research. First, little research on social impact has been conducted with regards to interpersonal and family adjustment. Second, many single-enterprise community studies emphasize quality of life and community satisfaction. Third, where questionnaires were administered they resulted in data which were not comparable.

Finally, and most importantly, there is an obvious lack of theory. Theory provides the limits and organization of a field of study, giving credibility to selection of variables, interconnection of variables and facilitates explanation and prediction. Without a theoretical framework, studies of single-enterprise communities will continue to be descriptive, providing little in the way of explanation or solution to the problems these communities face.

E. MODELS AND GEOGRAPHY

Urban geography as a part of geography overlaps with many other urban oriented sciences. As a discipline urban geography purports to describe and explain areal differentiation within urban areas and within urban systems. (Yeates and Garner, 1971, 1-6) Carter (1972) states that urban geography concentrates not on process but on consequence. If urban geography concentrates only on consequences or resulting morphology, then it would make the

discipline entirely descriptive and lacking explanatory powers. There is a growing recognition that urban places are not only in continual flux, but that the morphology of cities must be explained through other systematic studies such as economics, sociology, history or political science. In order to describe and explain, urban geography must, of necessity, be multi-disciplinary in nature and focus on both consequence or spatial pattern and process. (Berry, 1964; Murphy, 1966)

This thesis, through the use of a model will attempt to describe and explain the spatial organization and development of a particular type of urban place, the single-enterprise community, keeping in mind the necessity of utilizing other systematic studies.

The use of models in geography is not new but appears to have gained a more central place in geographic study in the 1960s. The foremost work in this area was produced in the 1960s and is synthesized in Chorley and Haggett's Models in Geography (1967). The definition of models chosen by Chorley and Haggett was devised from work by Skilling in 1964. Taking a broad universal view of models, Skilling argued that models can be theories, laws, hypotheses or simply structured ideas. Put another way, models are man's simplified and intelligible portrayals of a rather complex world. "According to this view, reality exists as a patterned and bounded connexity which has been explored by the use of simplified patterns of symbols, rules and

processes." (Meadows, 1957, 3-4) Much like reality, models as a structured reflection of reality, must reflect the dynamics of the situation they portray.

As reflections of urban reality, geographic models as applied to urban places must be dynamic, incorporating change because urban places grow and decline in accordance with economic, demographic and social changes in society. Due to the multi-disciplinary nature of urban geography it is central to any urban geographic model that it consider those factors which came to bare in producing urban pattern.

Models have a number of characteristics and functions. First, models represent selective information reflecting the connectivity of some significant aspects of reality. Second, models are structured, seeking out pattern in some relationship. Third, models are suggestive, tempting us to formulate new hypothesis and drawing out our intuition or Gestalt knowledge. Finally, models must be applicable to other similar occurrences in reality. (Chorley and Haggett, 1967, 23-24)

The functions of models are many, but one of their most important functions is intellectual in enabling a phenomenon to be comprehended where the reality is too complex to grasp. Models perform an organizational function by providing a framework for the definition, collection and ordering of information. There is also a logical function to models, through the explanation and prediction of phenomenon. Models perform a normative function by comparing

some phenomenon with a more familiar one. (Hutton, 1953, 285-6) The constructional function of models is derived from the fact that they form stepping stones to theories and laws. Models and theories are closely linked. (Theobald, 1964, 260) The major difference between theory and model is the degree of probability with which they predict reality.

One last function of models, and a very important one, is the cognitive function. The use of models in teaching and research to communicate scientific ideas must not be underestimated because communication of knowledge is central to science. Communication leads to new ideas and a furthering of science. Communication is "not a matter of merely the sociology of science, but is intrinsic to its logic; as in art, the idea is nothing till it has found expression". (Kaplan, 1964, 269) The argument can logically be extended to say the expression is nothing unless it is comprehensible by others. Models are therefore extremely important in science when they can be used as tools of communication.

Models have themselves been classified and modelled, (Chorley, 1964, 44), and have been divided into descriptive and normative models. Descriptive models, represent a systematic description of reality, while normative models involve substitution of a more familiar situation for a less familiar one. Descriptive models, which are the concern of this thesis, are either static, concentrating on structural features in equilibrium, or dynamic, centering on process

and function over time. Suppes (1962) stated that descriptive models concerned with the organization of empirical information can be data, taxonomic or experimental design models. The model to be described later in this chapter is a conceptual model, describing the dynamic process of single-enterprise community development. The model is a classification (taxonomic) model because it simplifies the development process by describing it in stages.

Models have been used in urban geography for many years, but the pervasive view among urban geographers that the discipline is concerned more with consequence than process has resulted in urban geographic models being static in nature, reflecting the urban landscape at a point in time.

Models on an inter-urban scale, despite the recognition of urban places as dynamic, have been of a static nature. The exception has been urban growth models based on economic concepts. Two such models are the Multiplier Effect Model (Tiebout, 1956) and An Evolutionary Model of Settlement Growth proposed by Martin (1969). The Multiplier Effect Model assumes the function of a city is economic and population size is directly tied to economic growth and follows what Myrdal (1957) called "the principle of circular and cumulative causation." Although this multiplier concept was developed to explain metropolitan growth it can no doubt be applicable to smaller communities.

Martin (1969) utilized a dynamic model and integrated the basic non-basic concept into a stage model which is essentially a long run theory of internal growth. The growth of urban areas distinguishes three stages:

1. The stage of original implementation.
2. The stage of linked implementation and extended economics.
3. The metropolis stage.

During Stage One, firms choose an urban area for reasons other than the size of existing population or the presence of other firms. During Stage Two, new firms locate in the urban area because of the earlier settlement of other firms. The third stage shows external diseconomies and a proliferation of non-basic service industries aimed at serving the urban population.

Although both of these models are dynamic they have a number of deficiencies from an urban geographic perspective. First, these models explain only industrial location (economic growth) as it relates to total population growth. There is no emphasis in these models on the social, demographic or political aspects of the urban process. Second, neither model states a consequence or links the model to a number of definite spatial outcomes or landscapes. Finally, the communities which will be dealt with in this thesis are included within Martin's initial stage.

Before presenting Riffel's Model of Resource Town Development, it is worthy to present a note on the pitfalls of model building. Although models can provide a means of making a complex world seem understandable, a number of problems also come to the forefront. Simplification can lead to covering up significant facts which are important to the overall system being modelled. In structuring models after the real world there must be a continual guard against spurious correlation. The suggestiveness of models must be carefully thought out as it could lead to improper prediction. The use of analogy in models must be continually questioned to ascertain if the analogy is in fact an unjustifiable leap into another domain. Chorley and Haggett suggest that these dangers are problems "of overemphasis on symbols, form, simplification, rigor and prediction." (Chorley and Haggett, 1964, 26) Finally, models in research and science require continual updating or discarding as they are outdated. This statement applies to urban geographic models as well.

Given these pitfalls, of model building, what criteria are essential in an urban geographic model? First and foremost, an urban geographic model must be dynamic, reflecting the nature of urban places. The model must deal not only with process, but also with consequence; what is the resulting urban morphology. The model must include all relevant significant factors in order to stimulate further evolution of the model.

F. THE DEVELOPMENT MODEL

Riffel's model of resource communities is significant to the study of geography because the model is dynamic, recognizing the change which occurs in urban communities. The emphasis of Riffel's model is process rather than consequence providing the potential for prediction. Although Riffel does not deal specifically with morphology or consequence it is implied in his seven stages.

Riffel, examining the quality of life in single-enterprise communities suggested that these communities passed through seven developmental stages which have different economic, demographic and social characteristics encompassing much of the three stages identified by Robinson. These seven stages are as follows:

- I) Natural or pre-discovery,
- II) Prospecting, discovery, exploitation and survey,
- III) Industrial and community construction,
- IV) Industrial operation and community improvement,
- V) Industrial and community operation, including expansion of secondary and service industries,
- VI) Community diversification,
- VII) Community maturation. (Riffel, 1975, 12-13)

Riffel hypothesizes that each stage will have a different set of economic, demographic and social characteristics. It should be noted that not all communities will or can pass through all seven stages. Some communities will become "frozen" at some stage of development or may

fluctuate between an operating stage and an expansion of secondary and service industries stage. From a planning perspective each stage in development, with its varying demographic, economic and social characteristics, requires entirely different services to deal with them.

The seven stages as hypothesized by Riffel will now be discussed in terms of the expected economic, demographic and social characteristics of each stage. Figure 2 provides a synopsis of the model and a guide to the description which follows. Riffel makes several points about the model which should be mentioned at the outset. First, single-enterprise communities do not necessarily follow an orderly pattern from the first to the last stage of development and may be subjected to periods of boom and bust, regressing to an earlier stage of development then recovering to later stages.

Second, movement through the stages has been left to chance and no deliberate attempt to plan for the stages and the corresponding characteristics and required services associated with each stage has been made. The maturity stage occurs only after a significant time, perhaps as long as three generations. It is important to note that no stage is suggested as optimum and no value judgement is attached to the "goodness" of any stage. The result or objective for all communities is not necessarily maturity. For example, there may be a resource so isolated yet important that it must be extracted. If no regional population or communities exist

Figure 2
Stages and Characteristics of Resource Town Development

Stages of Development	Economic Characteristics	Demographic Characteristics	Social Characteristics
I Natural or pre-discovery	No economic activity or only hunting and fishing by native peoples.	No population or only small bands of native peoples.	Unpopulated or small, isolated native communities in limited contact with white society.
II Prospecting to Survey	Short-term activity. Money spent "outside." Traditional native economy persists, with some trade with whites.	Short-term, summer residents. Young men, no women. If there originally, native people in the majority.	Isolated. Usually, access by air only. Shack towns without amenities. Some contact with native peoples.
III Industrial and Town Construction	The first boom period. Mushrooming economic activity. Natives may be employed.	Mostly single men. Some young workers with families. Very high turnover rates. Native in minority; only stable group in population.	Isolated, but easier access to outside. Trailer towns with basic amenities, and "pub." Signs of social problems among native peoples.
IV Industrial Operation and Community Improvement	Shift in construction from industrial to residential and commercial. More money spent in town. Falling off in employment of natives.	Slowing rate of turnover. Increasing number of married workers. Native peoples a small minority.	Improvement of housing and community facilities. Completion of roads and communications services. Reduced social problems among whites; increased among natives.
V Industrial and Community Operation	Construction over. Services established. Much of labour skilled. Few natives employed.	Turnover rates reduced to 60 per cent. Young married workers in majority.	Amenities well developed. Few social problems among whites, but boredom among wives. Natives on welfare. Marked stratification.
VI Community Diversification	Stabilization of industry. Expansion of other services. Small manufacturing.	Labour turnover stabilizes at 35 per cent. Young married in majority.	Employment for wives available. Special programs, created largely for native peoples.
VII Community Maturity	Diversified economic base. Limited opportunities for expansion.	Balanced population structure in terms of age and sex. Low rates of turnover.	Sense of community and belongingness. Whites and natives on welfare. Less racial tension.

Adapted from: J.A. Riffel, 1975, pp. 12-13.

and the resource will be exhausted in five years, then the community will never advance beyond the industrial and town construction stage. The model is important in a planning and geographic sense since it implies that the regional context must be considered when each community is planned.

I. The Natural or Pre-discovery Stage is characterized by a lack of economic activity or if any exists it consists of hunting, fishing and trapping by native peoples.

Demographically the area has little or no white population and perhaps small bands of native peoples. The social characteristics are typical of small isolated native communities in unpopulated areas. These communities usually have little contact with white society.

II. The Prospecting to Survey Stage is typical of short term activity and consists of survey crews, seismic crews, or a team of geologists collecting information about resource potential. This information is typically sent back to the metropolis where it is evaluated, and if favorable, land is assembled and various regulatory agencies contacted for permission to proceed. The majority of the money is spent in the southern metropolis. Typically this stage is characterized by settlements of non-permanent residents, usually summer, with very few if any women. If there was a native settlement at the site, then the natives will be in the majority. Socially, the conditions are far from perfect, being accessible only by air, the community is isolated, perhaps even desolate, and is typically comprised of

temporary housing structures, such as tents, temporary bunkhouses or shack towns with no amenities. There may be some contact with the native population.

III. The Industrial and Town Construction Stage is the first boom period. A decision has been made to extract the resource and regulatory bodies have approved the industrial construction. The economy mushrooms from nothing to one requiring a very large labour force and huge injections of capital. If natives were in the area they may be employed, usually in unskilled labour jobs. The area still consists primarily of men, but if housing is available, some workers with families will be present. Labour turnover rates during this stage are very high and the only stable group in the population, if present, is the native minority. Socially the area is still isolated but access will be easier, e.g., perhaps a road will have been built to bring in the necessary industrial equipment. The community will consist largely of mobile homes, some services may be available, and most likely a "pub" or beer parlor will be in full service. Native peoples may begin to exhibit social problems.

IV. The Industrial Operation and Community Improvement Stage is typical of a shift from industrial to residential and commercial construction. The major economic investment shifts from the industrial site to the town site. Labour turnover rates are still high but have slowed. Married workers, normally the work force of the industrial plant, begin to move into the community, bringing their families.

Native peoples become a small minority usually segregated to an area of town. Socially, there is an improvement in housing and community facilities. Roads, communication services, and medical facilities are completed. Social problems among whites begin to decline, while they are increasing among the native population.

V. Industrial and Community Operation is typical of a highly skilled labour force, a reduction in employment in native and manual labour. The construction boom is over and the community and services are established. The majority of the community is comprised of young married workers with young children. Labour turnover rates may be reduced to 60 per cent but population is still highly mobile. The community amenities are well developed, but lacking opportunities for employing wives. The community displays signs of social stratification, and the native population have become almost entirely removed from the labour force, and are mainly on welfare.

VI. Community Diversification shows stabilization of industry, an expansion of available services, primarily government. Some secondary industry or small manufacturing has entered the community. Labour turnover will remain relatively high but stabilize at about thirty five per cent. The community will still consist of a young married population. One of the most significant characteristics of this stage is the expansion of employment opportunities and the increased opportunity for wives to work. Special

programs may be created to assist native peoples. This is also the stage when social problems become apparent. The bored housewife with "bush fever" or psychosis is typical.

VII. *Community Maturity* shows a diversified economic base with an expansion to at least two major industrial employers. The economic expansion of the community will be very limited. The population structure will be balanced in terms of age and sex, and low turnover rates will be the norm. Socially there will exist a sense of community and belongingness. The residents will be more committed to the community as their town or community. Welfare recipients will include more whites and racial tension will be lowered.

In earlier portions of this Chapter reference has been made to planning. Urban planning is closely related to urban geography in that both are concerned with urban morphology. While planning is a deliberate attempt to bring about a desired state or morphology; urban geography is concerned with all aspects of urban places. As modern single-enterprise communities are planned communities a discussion of planning in single-enterprise communities follows.

In terms of planning it is worthy of mention that responsibility for planning the community changes rather dramatically over the development stages. The traditional pattern of responsibility for planning has been as follows. The corporate body or industry has the highest level of responsibility for planning in the early stages. As the

community progresses through the stages this responsibility is diminished and almost completely depleted in most cases, when the industrial operation is in full service. Lucas (1971) calls this stage transition. The responsibility for planning which is borne by the community itself or some government agency, is working in completely the reverse manner. The early stages of development are characteristic of low government and community involvement and as the community moves toward maturity there is an increasing responsibility for the community's planning.

Most of the community or government involvement in planning, will occur when a community complete with infrastructure, services, and housing will be inherited, perhaps with little or no concern for regional settlement patterns, quality of construction, or long term debt problems, from the single-enterprise parent. Richardson in Plan Canada (1963) says it best

This failure to consider Kitimat as anything but an expedient design, however competently, to meet the exigencies of an immediate practical problem has in fact been apparent from its very inception. Consider the circumstances; here was a town established in a region with a great and almost untouched store of natural resources, a town confidently expected to be the largest in hundreds of thousands of square miles, yet next door to another (Prince Rupert) which had been founded only a few decades earlier amid even rosier hopes only to become a shabby fishing community. But almost no thought was given to its prospects as a regional centre, almost none, in fact to the eventual settlement pattern of the region or to the appropriateness of Kitimat's location from this point of view, or even from the point of view of the eventual development of resources other than hydroelectric power. Here was a site that met the requirements of the company for the production of aluminum; that was sufficient. Its

suitability in terms of the future economic development or human settlement of the region was simply not a relevant consideration. (Richardson, 1963, 120)

Even though no comprehensive plan using the model has been developed, one study and one plan have at least implicitly utilized some type of staged development approach. Richardson, albeit not working in this framework, identified the similarity of the development of these two communities despite the fact that Kitimat was planned and developed some fifty years after Prince Rupert. Perhaps the most significant thing which comes from the article is the need to consider the regional context of the single-enterprise community, its relationship to the settlement pattern and its future integration into the settlement pattern. The fact that neither community achieved its planned destiny resulted not from poor planning but from poor economic planning.

Richardson states that economic planning and regional planning should be viewed as "two sides of the same coin." (Richardson, 1963, 122). Corporate enterprises generally are concerned with the profit and loss statement of their company, and regional development is well beyond the responsibility and interest of the corporate body. The development of single-enterprise communities demands more than a plan for housing a workforce, but also requires regional planning which in turn requires public participation, initiative and responsibility.

In order to achieve regional goals it is necessary to understand and plan the development of communities not in isolation but in relation to each other and this implies comprehensive regional planning. In order to achieve regional planning goals it is critical that the single-enterprise community, its growth, development, and regional contribution be understood and planned. Particularly in areas of resource exploitation such as the exploitation ecumene. Not every community will be able or should be planned as a regional center, but to leave the development of regional centres to chance will have catastrophic impact on the settlement pattern, and perhaps a result which is not entirely desirable.

The second example of the use of a development model and an attempt to integrate a single-enterprise community into the development of a regional settlement pattern is the community plan for the development of Leaf Rapids, Manitoba.

Regenstreif (1977) identified three stages in the community plan for development. Stage A, with a population of 900, included all the essential community functions. Infra-structure was in place. Stage B, with a population of 1500, allowed for increases in the existing residential, recreational and retail-commercial facilities. Stage C, with a population of 3500, allowed for a highway bypass and increased residential facilities. This stage brings the community to the limits of capacity and the community plan is essentially completed. Although the planning for stages

in development considered the regional context of the community, the community was not planned to reflect the varying economic, demographic and social changes which are presented in Riffel's model.

G. CRITICAL EVALUATION OF RIFFEL'S MODEL

Riffel's Development Model is a conceptual model, representing an idealization of resource based community development. As a conceptual model it reflects the multi-disciplinary approach to urban geography, emphasized by Yeates and Garner (1971). As a conceptual model, Riffel's model, has sprung largely from intuition and some observed results reported by other authors.

Riffel's model, conceptual in nature, is only the first step of the analog reasoning process and like most conceptual models is too complex to handle. The model must now be subjected to further simplification by discarding extraneous information to discern the simplest and most significant aspects of the process being modelled. The verification which will be attempted in this study is an attempt to simplify Riffel's model through the reduction of extraneous information in the conceptual framework.

The *Natural or Pre-discovery Stage* is very poorly documented in terms of the three characteristics Riffel uses to describe each stage. This stage could be better described as a non-stage, as there is no population, no economic activity and without population there can be no social

interaction. Even when native populations are present they are most often nomadic and have little or no impact on the location of the single-industry or the single-industry town.

The *Natural or Pre-discovery Stage* is important, however, in as much as the native population experience the greatest degree of culture shock when their bio-physical, social and cultural environments are changed. When the bio-physical environment is changed it often changes the native economy by pollution of rivers, disruption of wildlife migration patterns and the like. Morrison (1977) studying Metis culture shock in the community of Grande Cache, found that the Metis were capable of handling the culture shock during the Natural or Pre-discovery Stage by limiting the duration of contact with white society and through close support relationships with family members.

Although Riffel recognizes the importance of environment it is lacking from his model. The harsh climate of many northern communities, the limited soil development in many areas and the issue of pollution of potential recreation areas are an obvious oversight in this stage of development. Physiography and geology are important aspects of this stage of development, but are lacking from the discussion of the model.

Another missing component of the model in all stages is the urban consequence, or resultant urban pattern. Riffel's use of such adjectives as small, limited, isolated, reduced, and balanced detract from the model's usefulness and make it

difficult to quantify. These terms lend a rather loose subjective interpretation to the stages of development.

The economic characteristics which Riffel attributes to this stage should also include trapping and guiding. Natives are also often engaged in construction or bush work for periods of short duration. Perhaps the most important social characteristic of this stage has been missed completely by Riffel. The amount and type of contact with white society is controlled by Natives. The importance of the family as a support mechanism is also missing from this development stage. (Morrison, 1977, 192-194)

The *Prospecting to Survey Stage* in Riffel's model is similar to the *Natural or Pre-discovery Stage*. The impact of development is minimal since the economic activity is short term. The Natives see the activity as non-threatening because of the short-term, limited disruption of their traditional economy. Their ability to limit contact or withdraw to their family for support further reduces the threat. Morrison (1977) states that in the pre-town stage "One of the primary functions the family seemed to fulfill was providing psychological support. ... home was where a person could relax without constantly having to worry about someone (Euro-canadian) telling them what to do." (Morrison, 1977, 194)

Using the example of Grande Cache, this stage lasted some forty-seven years with very limited impact on the area. The tar sands of Fort McMurray show a similar pattern, in

that the sands were discovered in the late 1800's and could not be developed until the late 1960's, when technology was developed to process the tar sands and the international economy made processing cost effective. These first two stages could perhaps be grouped together and using Morrison (1977) be termed as pre-town or pre-industry stage.

The *Industrial and Town Construction Stage* as described by Riffel, is riddled with descriptors such as mushrooming, very high, mostly, stable, basic, and easier. (Riffel, 1975, 13) The problem this generated is that they all conjure up very subjective connotations. What is easier access, what comprised basic amenities, what are signs of social problems, what does mostly single men mean? Intuitively, these descriptors fall well within our stereotype of single-enterprise communities. Riffel has not defined any parameters in this or any of the other stages, nor has he defined concepts such as 'labour turnover', or 'social problems'.

Riffel's fourth stage, *Industrial Operation and Community Improvement*, would seem to be a part of stage three and the major difference appears to be a shift of construction from the industrial plant to the community. Although Riffel seems to imply that the completion of roads and communications are social characteristics, it would seem more logical that these roads are being completed to service the industrial entity and reduce the cost of supplying the community. This is not to suggest that improved access to

other areas would not have a social impact.

It would seem more logical that these two stages be grouped together, as a construction phase. This would also give a more definable time frame for the stages as the start and finish of construction are more easily understood. This would also provide more definite milestones which could define chronological frames for studying the development stages.

The *Industrial and Community Operation Stage* is signalled by the end of construction and the establishment of services. This stage, like the others suffers from the use of vague and ill-defined descriptors. Riffel also states that the turnover rates are reduced to sixty per cent. Any rate must also specify the time frame. For example, sixty per cent turnover in a year is high, but sixty per cent turnover in five years is low. Labour turnover must also be clearly defined and in this case it has not been.

Riffel identifies boredom among wives as a major social problem. Often referred to as bush fever, this myth has been dispelled. Nichels *Et al.*, (1976) in their study of psychoactive drug usage found that the use of psychoactive drugs was seasonally higher in winter but not higher among females. MacKinnon and Neufield (1972) found that there were a myriad of problems in northern living but they were problems for both sexes. MacKinnon and Neufield (1972) found some evidence of anxiety and depression but no evidence to suggest boredom was the cause of the depression.

Lucas (1971) identified a transition stage during which responsibility for planning and administering the community was turned over to the community.

The *Community Diversification Stage* is described as having a stabilized industry. When in fact a new or second industry is being added through industrial diversification, often government. Riffel may have been trying to suggest that the single-enterprise industry stabilizes. Riffel also suggests that labour turnover stabilizes at thirty-five per cent. Once again the time frame of this turnover is missing. The availability of employment for wives also seems to conflict with the stabilization of industry. The stage name '*Community Diversification*' implies change, yet parts of the stage description suggest stability, or maintenance of an existing balance. This research will suggest that this stage is a dynamic stage with significant changes in industrial composition, population change and social implications.

Community Maturity is not clearly defined by Riffel. Maturity must be clearly articulated because of its rather subjective nature. Riffel states that a sense of community and belongingness is achieved. Unfortunately, this cannot be measured effectively. There is also the problem that this *gemeinschaft* type of society very rarely develops in our *gesellschaft* oriented post-industrial society.

In terms of economic differences from the community diversification stage, maturity does not appear to have any

significant differences. Riffel states that this stage has a balanced population structure in terms of age and sex. It is not clearly stated what a balanced age-sex structure is or should be. Riffel also states that racial tension is lessened during maturity. No evidence is presented to support this statement, nor is any mention made during earlier stages that racial tension exists or comes into being at some prior stage of the model.

H. SUMMARY

Riffel's model, although it is attractive intuitively, it is weak because of its lack of documentation and rather subjective description. The model is also attractive because of its synthetic nature and the need for dynamic models in urban geographic research. The model does not deal with the geographic aspect of development or the urban consequence.

The model appears to be what Chorley (1968) calls the first step of model building, conceptualization. Riffel has attempted to go beyond this stage by introducing some observed results - high turnover, racial tension - without first going through the second step of model building.

Despite its shortcomings, the model is important in geography because of its multi-disciplinary approach, its potential for clarifying the development process of single-enterprise communities or leading to a better understanding of the interrelationship between the characteristics of urban places.

III. METHODOLOGY

The purpose of this chapter is to describe the methodology, selection of communities and techniques used in this thesis. A description of model testing in the context of this research will be presented. The selection of study areas will be explained. The Census, as an information source is described and the limitations of using census data is documented. Finally, the various techniques utilized in the research are presented.

A. STUDY OBJECTIVES

The objective of this research is to test Riffel's model of single-enterprise growth and development. The following hypothesis will be examined:

single-enterprise community development occurs in stages which have distinctive economic, demographic and social characteristics.

This study will attempt to support the hypothesis by identifying and comparing the changes in economic, demographic and social indicators of single-enterprise communities in predictable historical development stages.

Utilizing the communities of Yellowknife and Whitehorse as analogous natural cases, the history of these communities is traced. Data from the Census of Canada were compiled and analyzed to determine if seven developmental stages occurred in the growth of these communities. When data were unavailable for the developmental stage, data from two single-enterprise communities in the exploitative ecumene

were substituted. This was necessary because only quinquennial data were available from the censuses.

In the search for development stages with distinctive economic, demographic and social characteristics, shortcomings of this approach were evident. The periodicity of censuses resulted in data not being available for several stages in the development of the two communities being studied. The small size of these communities made data accessible only by enumeration area. The data available from censuses after 1971 were subjected to random rounding. Random rounding results in data being rounded up or down to the nearest multiple of five. This mitigates against adding more than a few enumeration areas together because as more cells are added together the error increases exponentially. The use of newer communities would have alleviated this problem to some degree. A data source with more frequent measurement would have provided better data for analysis.

B. MODELS AND AN INDICATORS APPROACH

Model building, or analog theory, has been used sparingly in the social sciences because of the complexity of experimental design needed to support such models. Despite these problems, the employment of analog theory remains a useful tool for furthering inductive reasoning.

Chorley (1968) identifies three stages of model building: (1) Idealization and Simplification; (2) Mathematization, Substantiation and Translation; and (3)

Interpretation. Riffel has used his knowledge of the real world to develop a conceptual model, idealization, of single-enterprise community development. Through direct reasoning Riffel has also simplified the model to seven stages.

In the overall process of model building the primary emphasis of this thesis is in Mathematization, Substantiation and Translation. As this study will not attempt to develop mathematical formulae or to develop experimental designs to substantiate those formulae, the study is by default a translation. Translation is the process of using an analogous natural circumstance and providing observation which can then be reapplied to draw conclusions about the real world, or provide feedback for the conceptual model. Two communities in Canada, Yellowknife and Whitehorse, are two natural models of single-enterprise community development which can provide observed results for all stages of development.

When information for various stages is unobtainable it is necessary to supplement the research data with data applying to other communities of single-enterprise in the development stage being examined. To this end, data applicable to Fort McMurray and Grande Cache will be introduced in the analysis.

C. SELECTION OF THE COMMUNITIES

There were a number of reasons underlying the choice of Yellowknife and Whitehorse as the study communities. In order to fulfill the objective of this study it was necessary to pick communities which potentially had gone through the stages and reached maturity. Two elements were critical in this context. First, the economic base must be diversified and no longer dependent upon its single-enterprise parent. Second, a number of years must have passed to allow the community to become mature, resulting in a stable population with a commitment to the community. Both Yellowknife and Whitehorse are at this stage in their development. These two communities are also appropriate for another reason, both have proceeded through an unplanned stage with spontaneous growth and were later replanned as new towns. (Pressman, 1974, 32). Both communities are in the Canadian north, defined as that territory north of 60° Latitude (Koroscil, 1975, 116) (See Figure 1). Both communities fall into the Exploitive Ecumene of Canada, an area of vast distances and extreme mineral wealth, requiring comprehensive regional and economic planning. The study focusses on these two northern communities and considers them case studies which may have implication for the development model.

Attempting to determine if seven development stages exist and because the information available from the Census will be limited to every fifth year, information from two

other single-enterprise communities located in the extractive ecumene was used. Fort McMurray and Grande Cache were selected on the basis of being located in the exploitive ecumene and the involvement of government in planning both communities. The underlying assumption is that if a stage occurs in one single-enterprise community it will occur in all single-enterprise communities. In order to operationalize the concept of maturity it will be necessary to examine a community which is in the extractive ecumene, but is not dependent on a single-enterprise. Grande Prairie is such a community. It is anticipated that the use of these communities will facilitate the testing of the model when data for Whitehorse and Yellowknife were not available. Figure 3 provides a schematic diagram of the seven Stages and when proxy communities were used.

D. DATA SOURCES

All information, unless specifically annotated differently, is derived from the Censuses of Canada. One additional source of information which will be used is the Municipal Census of Fort McMurray. Although the Municipal Census was not subject to the same rigorous testing and application the Census of Canada requires, the definitions used in the Municipal Census were patterned after the Census of Canada.

Thesis research has traditionally included primary research including field work and interviewing. Since this

Figure 3

Study Communities and Development Stages

Stages of Development	Study Community
I Natural or Pre-discovery	Northwest Territories 1921
II Prospecting to Survey	Northwest Territories 1931
III Industrial and Town Construction	Fort McMurray 1966, 1976
IV Industrial Operation and Community Improvement	Fort McMurray 1971, 1979
V Industrial and Community Operation	Grande Cache 1971, 1976 Whitehorse 1951 Yellowknife 1951
VI Community Diversification	Whitehorse 1961-1971 Yellowknife 1971, 1976
VII Community Maturity	Whitehorse 1976 Grande Prairie 1976

thesis has deviated from this norm it is worthy of note that a secondary data source has proven valuable in conducting research. The expanded coverage which the Census provides can be a valuable component in explaining urban change. The Census in and of itself, however, provides only information, which must still be interpreted and analyzed to understand and comprehend the meaning of the data.

The flexibility of primary research cannot be matched by the Census. The use of the Census data is constraining in terms of the timing of measurement as well as the design of questions for general information rather than addressing a specific problem a researcher may want to address. The use of secondary data sources for research purposes provides the greatest benefit for the least cost. Attempts to gather the data needed to calibrate the model addressed in this thesis would be staggering in cost. This thesis suggests that secondary sources could be utilized more before a researcher begins the expensive and time-consuming effort of gathering primary data.

The Census is but one source of data and the validity of this development model must be set to more rigorous tests using different measures of economic, demographic, social and geographic information because a model, be it descriptive or quantitative in nature, requires that a certain set of parameters be established which will uniquely identify each of the stages of model.

Data used in this thesis were retrieved primarily from published Census data. Where information was not published, enumeration area data were aggregated to provide the relevant information.

In order to undertake this study some standard comparable longitudinal data base is necessary in order to make valid comparisons. The only source of this type of data is the Census of Canada, conducted every five years. The study will be restricted, therefore, by the data available from the Census. The study will remain macro in its emphasis, concentrating on the community as a whole rather than neighborhoods within the community. The exception is the stages of social development where an examination of enumeration areas will be undertaken to establish if some residential segregation exists.

Censal symptomatic indicators provide a comparative longitudinal data base which can provide an indication of the economic, demographic and social conditions of the community at a given time. It is important to understand that as indicators these statistics are a reflection of some phenomenon which occurred in the community.

Censal indicators can be viewed as proxies of the conditions of the economic, demographic and social system and are only

...as good as and subject to the researchers practical experience and intuition as to the relevance of the statistics (Henderson, 1974, 32).

The selection of censal indicators is based in part on prior

research, the practical experience of the researcher and to some degree intuition. Census data remain one of the most reliable and accurate sources of information available to researchers.

E. SELECTION OF INDICATORS

The selection of indicators to be used in this study is limited by the descriptive nature of the model developed by Riffel. In order to operationalize the model it is necessary to establish the parameters of each stage. For example, each stage must be distinct from each other stage by some expected degree or the stage is not a unique stage in development.

Two economic variables which are collected and published in each decennial census are the industrial and occupational structures of the labour force. For each period that data are available, the level of dependency of the labour force on a given industry can be identified. Occupational groupings provide further evidence of single-industry dependence by revealing high proportions of occupations specific to various industries.

Employment by sector was used because it is available from the Census and prior work by Wilson, studying Australian mining communities, developed a methodology to classify and characterize communities by the relative proportion of employment in the primary industry. The model also called for diversification of the labour force in Stage

VI and employment by industry provides this information. Wilson found that 87.5 per cent of all mining communities in Australia had more than thirty-two per cent of the labour force employed in mining, the dominant economic activity. (Wilson, 1962, 129).

The Department of Regional Economic Expansion (1977) used thirty per cent of the labour force employed in a single industry to operationalize the concept of single-enterprise community. In this study thirty per cent employment in a specific industrial sector will be considered as a single-enterprise community. Diversification will be considered to be less than twenty per cent employment in any given industrial classification.

Demographically, the model identifies population growth, numbers of married and single people, population turnover and the sex balance as distinct in the various phases of development. For the demographic portion of the study these demographic facts will be analyzed. If there are seven stages in development, then the parameters of the demographic characteristics will be described. To establish if there is a significant turnover, population growth and imbalance in the sex ratio, a control community will be used to compare against the single-enterprise communities in the maturity stage. Grande Prairie was chosen because it has a diversified economic base, a stable population, and is located in the extensive ecumene.

The concept of life cycle stages will be used in analysis of the age structure of the development stages. The concept is that people pass through stages in the life cycle from childhood, to youth, early and late maturity and finally into retirement. (Lansing and Kish, 1957, 512-519) The concept will be used in this thesis primarily in a descriptive manner.

We have mentioned the decline in the sex ratio and implied that the modern single-enterprise community is different from the earlier single-enterprise communities. In order to establish this, a number of dissimilarity indices were derived and the modern resource community, was compared with the earlier single-enterprise community. The index consists of a derived number which indicates the relative amount of difference between two populations. The mathematical formula used is as follows:

$$ID = \frac{1}{2} \sum |r_{2a} - r_{1a}|$$

where

ID is the index of dissimilarity

r_{2a} is the percentage of population in the age groups
0-4 to 65+ of the second population

r_{1a} is the percentage of population in the age groups
0-4 to 65+ of the first population.

Shryock and Siegel (1973, 233) warn that the number of age groups will influence the index and the index is most useful for comparisons calculated using the same number of age groups.

This thesis will examine the social characteristics of the single-enterprise community by analyzing a number of social indicators including: occupational structure, income, education, religious affiliation, ethnic origin, marital status, and housing type and tenure.

The social characteristics portion of the study will deviate slightly from the methodology used previously. This part of the thesis will use a social geography approach which will map the social characteristics of the Whitehorse, Yellowknife, Fort McMurray and Grande Cache communities by 1971 enumeration areas. This approach was used because of the work conducted by L.D. McCann. In his study of Kitimat, utilizing 1971 enumeration area data, McCann found a pattern of residential segregation which was differentiated primarily on the basis of social class. The objective of this part of the thesis is to examine various communities which were in differing stages of development to determine if the pattern of residential segregation changes during the stages of social development.

A number of variables were selected and information about the variables was collected for all enumeration areas in the community. Included in this analysis were: occupation, educational attainment, religious affiliation,

income, ethnic origin, and housing by type and tenure. It should be noted that the resulting patterns are influenced by the shapes and sizes of the enumeration areas. The enumeration areas are set by Statistics Canada to capture the Census data and may not give a very accurate reflection of the ecological order of residential differentiation.

A social geography approach is more useful than a community profile approach for the following reasons. First, the communities tend to lack occupational diversification because of the single-enterprise employer. Second, housing is primarily of the same era and quality since it was all built at the same time. The social distinction often expressed by high quality housing, is therefore blurred or eliminated. Instead of a better grade of housing, class position is reflected in location within the community. Third, the social status of an employee corresponds to the employee's position in the company. Lacking is the anonymity of communities with a wide variety of employers. The entire community knows the social position of everyone else because they know his position in the company.

As the available comparable data relates to 1971, the information relates to only the later stages of development. Fort McMurray was in Stage IV in 1971, Whitehorse and Yellowknife were in Stage VI, and Grande Cache was in Stage V. The very small population size of Grande Cache influences the patterns which are observable. McCann (1978) studied Kitimat data for 1971 and found a distinct social pattern,

not unlike the pre-industrial city. This is not at all surprising given the single-enterprise is normally located outside the bounds of the community, leaving the central areas for community services and retail activities.

The most desirable locations are within easy access of the downtown shopping area, permitting the housewife to have access to shopping by walking downtown. Schools are usually centrally located as are the majority of services and facilities. This results in a desire to be near these facilities and land adjacent to this central area is in high demand. Marsh (1970) postulates that the social status normally associated with housing is lacking in resource communities because of the very uniform quality of housing.

One variable which could indicate status and maturity in such communities is tenure. The higher socio-economic status groups would most likely own their homes while the majority of employees would be renters. The earliest stage for which data is available from the five communities in this study is Stage IV, Fort McMurray and the community will therefore be the starting point for this analysis. In all cases the comparisons are made across enumeration areas and all percentages are representative of the proportion of the enumeration area expressed as a percentage of the total.

F. LIMITATIONS

Whenever data are collected there is a limit to the accuracy of the data and this must be recognized at the outset. In the case of the Census of Canada there are two types of data collected. Data which are collected for all persons in the country, such as, age, sex, marital status, mother tongue, number of households, number of families. These data collected on the short form provide very accurate information, and had an associated sampling error of 1.5 per cent in 1976. Clearly these data are the most reliable and accurate available.

The remainder of the data are collected on a long form, a sample of one-third of the population. These data are then extrapolated to cover the entire universe of the population. Published statistics therefore pertain to the entire population. The reliability and accuracy varies with the complexity of the questions asked. Error rates as high as twenty per cent have been identified in the occupation data responses from males aged 20-34.

In the case of Whitehorse the population reported in the census figures was adjusted to control for annexation. Without this adjustment the population growth of the community would appear to be erratic.

The accuracy of census information is limited further by random rounding. Each figure reported in census publications after 1971 was rounded to the nearest five randomly. Although this does not seriously affect the

accuracy of individual figures, enumeration area data which must be aggregated are seriously compromised if a large number of enumeration areas are aggregated. As more individual information is added the error rate increases exponentially. This problem makes the 1971 data for Whitehorse suspect.

Only 1971 Census information was used in the social indicators because of the definitional changes introduced in the 1971 Census. All information presented in the thesis was derived from Census information and therefore reflects data reported by place of residence.

IV. ECONOMIC CHARACTERISTICS OF SINGLE-ENTERPRISE TOWN DEVELOPMENT

A. INTRODUCTION

Due to the vagaries of the international market place and the history of Canadian resource towns, the evolution of a model of development which has distinct stages and allows for both progression and regression is not at all surprising. From a geographic perspective it could be stated that each stage with its accompanying characteristics represents a relative change in the situation of the town. These changes vary from environmental potential to an economically diversified community, acting as a regional service centre. These changes occur partially through geographic inertia but can result from decisions which are imposed upon the environment by man. As an example, the community of Dawson City lost the economic function of both service centre for the Yukon and capital of the Yukon because of the decision to transfer the territorial capital from Dawson City to Whitehorse.

One of the problems of these single-enterprise communities is that the continued existence of the community is dependent upon the one industry located there. Changes in technology, world demand, or a depletion of the resource, give rise to lay-offs, slow growth or even ghost towns. Because communities take on individual characteristics over time and development occurs in differing time frames, this

study will examine the communities of Yellowknife and Whitehorse separately dealing with the development of each community chronologically and attempt to identify the economic characteristics of each stage of development. The summary at the end of the chapter will attempt to fit these characteristics into Riffel's model.

B. YELLOWKNIFE: ECONOMIC CHARACTERISTICS OF DEVELOPMENT

This portion of the study will draw heavily from the prior work conducted by L.S. Bourne in his masters thesis "Yellowknife, N.W.T. A Study of its Urban and Regional Economy." (1963) and "Urbanization in the Canadian North: Yellowknife, N.W.T." by Paul Koroscil (1971). The objective of this particular exercise will be not to duplicate these two studies but rather to interpret these studies in the framework of Riffel's model, generating a description of the economic characteristics of each of the stages. Due to the length of development at least some of this thesis must be of an historical geographic perspective.

Riffel's model characterizes the *Natural or Pre-discovery Stage* of development as comprising no economic activity other than hunting and fishing by native peoples. This period is the pre-1926 era for Yellowknife. Although not specifically identified by Riffel there are a number of natural or pre-discovery environmental factors which will help clarify the development process. Three particular aspects of the physical environment must be considered. The

physiography and geology, the climate and the soils of the region must be considered if the economic activities of the region are to be understood. The physiography and geology are important aspects because in the north they will determine the future of the area and the potential to act as a service centre for the region.

Yellowknife is located in the Canadian Shield, an irregular, hummocky peneplain varying in altitude from 200 feet in the northern parts of Great Slave Lake to 1,000 feet near Great Bear Lake. During the last Ice Age, glaciers moved over the area causing scouring and striation of rock outcropping changing the drainage system to an irregular, almost confused pattern. Glacial retreat left shallow deposits of glacial till reducing relief and adding to the areas peneplained appearance. The townsite of Yellowknife is a glacial deposit of sand and gravel, located in the perma-frost region of the north. A surface layer of active thawing varies in depth from one to two feet or four to five feet in cultivated areas. The glacial sands of the townsite are the most suitable construction sites in the Mackenzie District.

The geology of the area is comprised of consolidated rock of the Precambrian Age. The oldest known types are the Archean volcanic flows of the Yellowknife group. Also known as the Yellowknife greenstones, this base group consists of andesitic and basaltic flows. The faulting in this area has displaced a large gold body into two distinct ore bodies,

the Giant and Con systems. Commercially, these two deposits are the most significant in the Yellowknife area. Within the the region there are also large commercially viable deposits of uranium, lithium molybdenum, mica, silica, and tungsten. Although some of these deposits have been exploited there exists considerably more mineral wealth.

Yellowknife, with its preponderance of mineral resources does face severe problems for settlement and development. The problem of construction of roads and buildings on perma-frost have been known for some time. The lack of arable land or even areas suitable for construction hinder development. Despite these problems the physical environment does provide some positive aspects for development, including the large number of potential sites for hydro-electric power. The physiography of the area with its vast expanse of exposed bedrock has facilitated efficient and cost effective prospecting throughout the area.

The most restrictive of the natural conditions is the climate. The long, cold, subarctic winters lasting an average seven months of the year are characterized by below freezing temperatures and few hours of daylight. Summers tend to be three months long with moderate temperatures. Temperature extremes are perhaps the most outstanding phenomena of the climate ranging from -51°C in the winter to 32°C in the summer. The presence of the Great Slave Lake acts as a moderating influence in Yellowknife's climate

reducing the effects of continentality of the area. Perhaps the most profound effect of the climate is not economic but social; the cold dark winters cause social problems which in turn is reflected in labour turnover, alcoholism and a myriad of other social problems.

Another inhibiting factor in development is the type of soils in the Yellowknife area. Typically azonal or intra-zonal the soils of this area are unconsolidated glacial tills, sands and gravels, silts and clays. Soil development is retarded by perma-frost, the inadequate drainage, the short summers and the light summer precipitation. A phenomenon known as "muskeg" caused by accumulation of peat is also encountered in the Yellowknife area. These soil types are the fundamental reason that no agricultural hinterland can develop. The muskeg areas also impede the development of a timber industry.

In keeping with the model a description of the economy of the native population follows. The native population survives through hunting, fishing and trapping. Although the area did support some big game the livelihood of the native population was primarily from trapping beaver, fox, muskrat, marten, mink, ermine, and bear. The area also had good stocks of whitefish, trout, pike and bluefish. Commercially, however, the fishing and trapping industries have little potential.

In light of the long-range development of the region the economy of the Yellowknife area is excessively dependent

upon the extraction of mineral resources for development. This limits the potential for diversification in Stage VI of the model.

Traditionally, the economic characteristics of the *Prospecting to Survey Stage* represents the search for suitable resources, such as minerals, hydro-electric power sites, transportation links or forest products. Such activity is normally started far beyond the local area in southern metropolises. The activity is usually short term, entailing short visits to the locality, with the majority of expenditures made outside of the area being investigated. The hunting, trapping, fishing and guiding economy of the native people continues to dominate the economy of the local area.

Although the initial knowledge of the presence of gold occurred during the Klondike Rush, very little prospecting developed until the late 1920's. Large scale prospecting activity started in 1926 when Consolidated Mining and Smelting Company (Cominco or Con) began exploration around Yellowknife Bay. From 1926-1931 Cominco continued exploration. Due to the depression and the inaccessability of the area, prospecting was halted until 1934 when air transport was first used for northern development. In the summer of 1934, Bear Exploration and Radium Limited discovered a vein of gold in the east side of Yellowknife Bay. In the following year gold was discovered in close proximity to the present site of Yellowknife. This find of

free gold in a surface showing led to a flurry of activity as prospectors staked claims in the area. At the end of 1936 Yellowknife consisted of one log building named the Corona Inn. The impact on the local economy had been minimal, consisting of summer prospecting. This stage ended in 1937 when construction of the Con mine started.

Of all the stages in the development of a single-enterprise community, the best known stage is the *Industrial and Town Construction Stage*. The vast input of capital to a region, which in northern Canada is generally characterized by a hunting and fishing economy, leads to a booming local economy. The stigma of vast economic resources attracts many would-be opportunists.

Yellowknife is no exception in this regard. In 1937, Con mining started construction of a vertical mine shaft and mill. At the same time Con began construction of camp buildings, an apartment, a hospital, a packing plant and some single family homes. Investment in the townsite was still quite minimal, consisting of these buildings, the Corona Inn, the RCMP building, and a multitude of tents. This initial boom period ended in February 1938 when Con began production.

In early 1938, during the *Industrial Operation and Community Improvement Stage* the townsite of Yellowknife was surveyed and some buildings erected. The boom of industrial construction led to optimistic investment in the community. More mines came into production and investment in

Yellowknife continued unabated. With labour attracted to work in the mines the townsite in 1939 saw an increase of 100 newly leased lots. Commercial agencies such as lawyers offices, lumber yards and churches were included in the new leases. The federal government spent \$15,000 for local improvements and a water and sewer infrastructure was built.

In 1939, despite the fact that new mines were coming into production, some 60 persons were unemployed. (Rae, Settlement of the Great Slave Lake Frontier, 1964, 289) This high unemployment in a small community was most likely a typical characteristic of communities in this stage. Labour involved in the industrial construction lingering due to the optimistic climate found that their skills are not transferable to residential construction or mining. Another group of opportunists attracted to the "fast money" available in the community found the mining companies had recruited from southern mining communities in order to obtain qualified and experienced labour; the result, unemployment. The decline in prospecting, due to the advent of World War II, brought a slow-down in the development of gold mining as more strategic minerals were sought.

Development did continue at a reduced level through to 1944 when the last mine ceased operation. Consolidated Mining and Smelting Company built a hydro-electric facility to serve the Con, Rycon and Negus mines as well as the community. The economic effect of mine closure was reflected in the population which declined to 200 in the summer of

1943. (Koroscil, 1975, 126).

Despite the interruption created by the Second World War, the boom period started again in 1945, with extensive prospecting. In 1945, interest in Yellowknife had increased to the point where 100 mining companies owned claims and some 22,000 people had entered the area. This was an estimate by the R.C.M.P. and should be viewed with some skepticism. (Rae, 1964, 303) Gold production had also resumed and by 1947 all of the mines built prior to the war were in production. Giant Yellowknife mine, whose discovery in 1943 had set up the extensive prospecting in 1944 and 1945, came into production in 1948.

Perhaps the most important milestone in the development of Yellowknife occurred in 1945 when the federal government decided to build a new townsite with a proper water and sewer infrastructure on a site where modern zoning and building regulations could be enforced. The new townsite construction was completed to facilitate the movement from the old town to the new town in 1947.

Some 100 new residential and commercial buildings formed the core of the new town. The facilities and services available were comparable to southern communities of the same size. Several other facilities were constructed during this stage, including a landing strip, and access to the landing strip, another hydro-electric plant and the MacKenzie highway was completed to Hay River. In 1948, the *Community Improvement Stage* came to an end with a

stabilization in labour requirements of the gold mining industry.

Characterized by an end in construction, and the establishment of services for the labour employed in the single-enterprise, this stage represents the end of the boom period for a single-enterprise community. In Yellowknife the *Industrial and Community Operation Stage* lasted from 1949 to 1967. Investment was very much reduced since the size of the labour force and its dependent population was reasonably well-established. The level of services required for the community had been well-established and become dependent upon the labour force for their support. Bourne presents statistics which although collected eleven years apart indicate the economic characteristics of this period reasonably well. These statistics for the years 1951 and 1962 clearly identify mining as the primary employer in the community in both years. In 1951, this employment represented 56.5 per cent of the total labour force and in 1962 43.3 per cent of the labour force, despite a decline of 218 jobs in the mining sector. These declines were the result of a reduction of mining personnel at both Con and Giant and closure of the Negus mine in 1953.

Using Wilson's criteria and the Canadian criteria for industrial dominance, the community of Yellowknife would be a single-enterprise community dependent upon mining in both 1951 and 1962. The decline in the mining sector was offset by growth in the service sector, notably in government.

There remained a dependency on the mining sector for continued economic viability. The total labour force participation rate remained relatively high at 71.6 per cent in 1951 and 68.4 per cent in 1962. The level of diversification of the economy was relatively minor during this period.

As mentioned earlier, some diversification of the economy had started prior to 1967, primarily in the area of local government. The *Diversification Stage* started in 1967 through the decision of the Federal government to make Yellowknife the capital of the Northwest Territories. This milestone was chosen as the start of the *Diversification Stage* because diversification requires an industry which can provide long term employment and is not dependent upon the single-enterprise of the community. The diversification will result in a new demand for labour, which will usually be highly skilled and be for occupations in industries not related to the single-enterprise base.

By 1971, the mining industry had been displaced as the largest employer by government. Public administration had the largest number of employees with 610 or 21.0 per cent of the total labour force while mining had 575 employees or 19.8 per cent of the labour force. Community, Business and Personal Services Group comprised 21.0 per cent of the employed labour force in 1971. Transportation, Communication and other Utilities had increased to include 10.2 per cent of the labour force or 295 employees. As suggested by

Riffel, the services sector expanded substantially as did government. Between 1971 and 1976 the labour force increased by 1,335 or 46.0 per cent. The diversification of the economy of the community produced a new wave of migrant workers. The influx of new migrants set off another round of investment in the community producing a small boom period.

The *Community Maturity Stage* is characterized as a diversified economic base with little opportunities for expansion. Given the vast resources of the Yellowknife region, the possibility of a change to provincial status and the movement towards a regional centre the opportunities for expansion in Yellowknife seem optimistic. It is doubtful that Yellowknife has yet reached this stage since community maturity may take up to three generations. (Riffel, 1975, 14). Clearly the wave of migrants who arrived in the *Community Diversification Stage* have not yet had time to accumulate three generations from this stage in the development of Yellowknife.

Regardless of the future fluctuations in the international market place the future of Yellowknife seems reasonably secure. As the primate city of the N.W.T., the potential for the future appears to be assured.

C. WHITEHORSE: ECONOMIC CHARACTERISTICS OF DEVELOPMENT

Whitehorse had its beginning some 39 years before Yellowknife, but its development albeit over a longer time frame is very similar to that of Yellowknife. As the

objective of this part of the study is the establishment of the economic characteristics of the stages of development in Riffels' model and since the community had its origins before 1900, this section will draw on two works in historical geography by Paul Koroscil. Located at latitude $60^{\circ}43'$ N and longitude $135^{\circ}03'$ Whitehorse is about the same distance north as Yellowknife.

Chronologically the *Natural or Pre-discovery Stage* was the period prior to 1896. As in the case of Yellowknife the physiography and geology, the climate and soils of the region will be presented in order to understand the future potential for the area to become a service centre. The Yukon is situated in the northern end of the North American Cordillera, with Whitehorse located between the Coastal Range and the MacKenzie Range on the Yukon Plateau. The Yukon Plateau is one of many irregular plateau between the two mountain systems.

This plateau is an average 5,000 feet in altitude with river valleys cutting from 1,500 to 4,000 feet into this plateau. The last Ice Age influenced the area and the resultant topography includes hanging valleys, moranic deposits, roche moutonnées and glacial deposits of sands and silts. The townsite is located in the Yukon River valley and in the perma-frost region of the north.

Geologically, the Yukon Plateau is granitic and batholithic, most likely Precambian in Age, interrupted by volcanic rocks of earlier origin. The bedrock has been

covered with glacial deposits of clay and silt and small amounts of sand. The region is rich in mineral wealth including gold, silver, lead, zinc, cadmium, and asbestos.

Whitehorse like Yellowknife lies in a region of vast mineral resources but faces problems of access. Despite the problems of perma-frost and the lack of arable land Whitehorse has considerable hydro-electric power potential.

Climatically Whitehorse is subarctic, with low temperatures characteristic of a continental climate. The climate is tempered by its location in the Yukon River valley. Generally colder than Yellowknife, Whitehorse has an average frost free period of 78 days a year compared to Yellowknife which has 113 days. Whitehorse has long cold winters with very few hours of sunlight. Temperature extremes from -51°C to 32°C have been recorded in Whitehorse. Psychologically, the climate is perhaps the most negative of the natural conditions.

Climate, of course, affects soil development resulting in soils which tend to be azonal and underdeveloped because of deficiencies in precipitation. Alluvial deposits have not developed because they are podzolized and acidic, resulting in low fertility. The development of the soils is further restricted due to perma-frost and the short frost-free period.

The native economy in the area is predominantly hunting, fishing and trapping. The indigenous tribe of the Yukon Valley were the Taglish. The Taglish were nomadic,

rarely staying in one location for more than a few weeks, and were known to camp for short periods near the present settlement of Whitehorse.

The Whitehorse area like Yellowknife is limited by the natural environment. The lack of agricultural potential and the minimal timber resources both indicate an economy which is excessively dependent upon the extraction of mineral resources. The lack of an agricultural hinterland will tend to restrict the potential of Whitehorse to develop as a regional service centre.

Although gold was discovered as early as 1847 in the Yukon, the richest discovery of gold occurred in 1896 on Bonanza Creek. Located north of Whitehorse this discovery initiated the Klondike Gold Rush. Some 100,000 migrants set out for the Klondike but only 40,000 are estimated to have reached their destination. There is no doubt that the economic attraction of the Yukon was gold, but the development of Whitehorse as a settlement was due to transportation.

Several routes already existed into the Klondike in 1896 including the Chilkoot Pass, and the Bering Strait, St. Michael route. In 1897 the Skagway Whitehorse approach over the White Pass was discovered. By 1896 Whitehorse was already acting as a staging point for the Klondike Rush. The settlement was on the east side of the river, and was called Closeleigh. The community was located at the north end of a five mile portage around Miles Canyon and Whitehorse Rapids

accessed by utilizing a tramway on wooden rails.

As in most single-enterprise communities during this period the expenditure of money outside of the local area occurred because building materials purchased in southern communities were shipped to Skagway. In the spring of 1898, charters to build a railway from Skagway to Whitehorse were obtained and construction began in May of 1898.

The *Industrial and Town Construction Stage* from mid 1898 to early 1899 was characterized by the commencement of construction of the White Pass railway. Taking some two years to complete the railway resulted in a shift of the Closeleigh settlement to the west bank of the Yukon River at the terminus of the new railway. Construction continued in the winter of 1899 and in July construction crews began working from both the Whitehorse terminus and Lake Bennet. The following year on July 29, 1900 the two construction crews met at Carcross and regular service commenced in August. The railroad in conjunction with a steamer service to Dawson City became the major distribution system for the Territory, as a result of cheaper and shorter transportation to the Klondike.

Construction of the narrow gauge railway of the Yukon and White Pass was not completed until July 1900 and went into regular service in August 1900. The demand for access into the Klondike forced the rail company to set up a regular service via rail and horse drawn cart early in 1899. This later milestone has been chosen to represent the start

of the *Industrial Operation and Community Improvement Stage* as this represents the operation of the single-enterprise industry of the community, transportation.

Industrial Construction and Operation continued for the next year and a half while in Whitehorse community improvement resulted in a new townsite being surveyed at the terminus of the railroad. During the winter of 1899-1900 the Closeleigh townsite was moved across the river to the present settlement of Whitehorse. One distinctive economic characteristic which can be easily surmised is the falling off of native employment. Prior to the regular service provided by the White Pass Railway in early 1899, natives were used to carry equipment over the Chilkoot Pass. This labour was no longer required when the regular service began.

The Industrial and Community Operation Stage, 1900-1938, made Whitehorse the transportation centre and therefore also the distribution centre for the Yukon. The community prosperity reflected the needs of the world. Its economy fluctuating with the requirements of the world market for various minerals. Due to the decline of gold production, attempts were made in the late 1920's and early 1930's to diversify the economy by attracting tourists. Although the influx was important in bolstering Whitehorse's faltering economy the mining industry and economy generally suffered during the depression.

When an existing community regresses to an earlier stage of development there may be a tendency for some of the stages to be skipped or the impact of the stages to be modified because of the existence of a community which in this case had already reached the fifth stage of development. The Second World War had an enormous influence on Whitehorse, but unlike Yellowknife which experienced a negative impact, Whitehorse experienced a positive impact.

This stage started in 1938 when an Order-in-Council established a Commission to investigate alternative routes for an Alaska highway. Four routes were investigated and in 1940 a two phase construction project was outlined for the route from Dawson Creek to Fairbanks. This route was considered the most attractive because of its inland location being less susceptible to Japanese air attack. The selection of the route and the feasibility studies were carried out in Ottawa and Washington, D.C. Along with the highway, the necessity of a supply of fuel was recognized and the Canol pipeline and service road from Norman Wells to Whitehorse were also approved.

During the construction of both projects, early 1942 to late 1942, Whitehorse was the operational base and distribution centre for work in the Yukon. This period saw the construction of many military facilities including barracks, storage and transportation facilities in Whitehorse. The airport was expanded and the settlement expanded east of the river and along the highway.

The continued military threat from Japan and the requirement for fuel for military purposes brought the Canol Pipeline Project into being. The rapid growth in 1942 generated an optimistic investment environment in Whitehorse. Private investment in hotels, stores and electric power led to a community with a strong service economy. Whitehorse now had three transportation routes as its economic mainstay, the airport, the Alaska highway, and the White Pass railway.

The decreased threat of the Japanese in the Pacific theatre brought a decline in the population of Whitehorse. The reduction of U.S. military forces coupled with the abandonment of the Canol project resulted in a slowing economy and much reduced private investment. The slowing economy stabilized as Whitehorse became the dominant settlement of the Yukon. This stage of development lasted only eight years as the *Diversification Stage* of Whitehorse development became a reality in 1953.

As stated in the case of Yellowknife, diversification required a commitment of long term capital and jobs for the community. In the case of Whitehorse, this assurance came in 1953 when the federal government moved the capital of the Yukon to Whitehorse. By 1961, the economy of Whitehorse had diversified into four sectors, no longer dependent upon the transportation sector as in the 1900-1938 period.

The major sector in terms of employment was Public Administration and Defense, contributing 587 jobs to the

labour force and representing twenty-five per cent of the total labour force. The second largest sector was the Community, Business and Personal Services Group with 24.6 per cent of the 1961 labour force. Trade, both retail and wholesale, provided 339 jobs in 1961 and was the third largest sector of the economy as represented by employment. The trade sector is reflective of the growth of Whitehorse as the hub of the Yukon transportation system. The fourth largest sector of the economy in 1961 was the Transportation, Communication and Utilities Group. Employing 314 people and comprising 13.4 per cent of the labour force it is clear that the White Pass Railroad no longer dominated the employment of the labour force in Whitehorse.

Perhaps a case could be made that Whitehorse had reached *Community Maturity* since there was little change in the economic base between 1961-1971. The four major groups which dominated the economy in 1961 still dominated the economy in 1971. A mitigating circumstance, however, is that opportunities for expansion may still exist. A strong policy of regional development could increase manufacturing and the finance sector of the economy. The advent of solar energy schemes holds potential for agriculture. The mineral wealth of the Yukon is still largely untapped; with known oil and gas reserves the potential for expansion seem real.

D. ECONOMIC CHARACTERISTICS OF SINGLE-ENTERPRISE COMMUNITIES DURING DEVELOPMENT

With the dates of the various stages of development established for Yellowknife and Whitehorse, this section provides the available empirical evidence for each stage of development. The early stages of development of the two communities were either prior to accurate Census reporting in the north or the communities were too small in population size to have detailed statistics. Recognizing this deficiency in the data series, information for earlier stages will be augmented with information from more recently emerging single-enterprise communities such as Fort McMurray.

The earliest stage in development is the *Natural or Pre-discovery Stage*, wherein the community and the region has little economic activity with the exception of hunting and fishing by native peoples. In the case of Yellowknife this period was the pre-1926 period and in the case of Whitehorse it was the pre-1896 period. The economy of Whitehorse was somewhat of an exception because the single-enterprise which developed was transportation. Transportation implies movement to and from someplace, and Whitehorse was the result of the need for transport into a remote area. Stage I and II for the community of Whitehorse paralleled Stage V for the Klondike gold rush.

The data which best describes this stage comes from the 1931 Census of Canada. Although Yellowknife had already

entered into the second stage of development, prospecting to survey, the impact of the gold discovery had not yet had any impact on the region and the native economy of Stage I had persisted into Stage II. The 1931 data for the Territory, therefore, provided an indication of the employment of the labour force for both stages I and II. The economy was clearly dominated by Hunting, Fishing, and Trapping accounting for 79.4 per cent of all occupations in the Territory. (Table 1) The labour force was male dominant with 3,153 males or 95.3 per cent of the total employed labour force being masculine. Of the females employed, 56.4 per cent were in occupations related to the service industry.

The *Prospecting to Survey Stage* occurred twice in the history of both communities. In Yellowknife, the first such stage occurred in 1926-1937 when the initial prospecting for gold occurred and it occurs again in 1944-1945 when new major gold finds were made around Yellowknife. The native economy, as evident from the prior discussion, remained dominant in Stage II. In the case of the second Stage II in 1944-1945 the traditional native economy which persists is now replaced by the established mining economy of Yellowknife. The native economy was interpreted to mean the economy which existed at the time of a new *Prospecting to Survey Stage*. In Whitehorse, this stage (1896-1898), was characterized by the search for new transportation routes into the Klondike. It was the relatively short overland portion of the White and Chilkoot Pass that made these

TABLE 1

Labour Force Comprising the Gainfully Employed
Ten Years of Age and Over by Industry & Occupation, for the Northwest Territories 1931

Industry/Occupation	Total #	%	Male #	%	Female #	%
All Occupations	3,309	100.0	3,153	95.3	156	4.7
Agriculture	3	0.1	3	0.1	-	-
Fishing, Hunting & Trapping	2,628	79.4	2,595	78.4	30	0.9
Logging, Mining, Quarries & Oil Wells	41	1.2	41	1.2	-	-
Manufacturing	48	1.5	12	0.4	36	1.1
Building & Construction	19	0.6	19	0.6	-	-
Transportation, Comm., & Utilities	34	1.0	34	1.0	-	-
Trade-Warehousing & Storage	124	3.7	123	3.7	1	0.0
Finance, Insurance & Real Estate	-	-	-	-	-	-
Service	326	9.9	238	7.2	88	2.7
Clerical Occ.	25	0.8	25	0.8	-	-
Other & Not Specified	61	1.8	60	1.8	1	-

Source: Dominion Bureau of Statistics. Census of Canada, 1931

routes particularly attractive over the other routes. However, from Koroscil's study of Whitehorse, the impact of the discovery of the White Pass was minimal since it was still an arduous journey to Whitehorse. This study also showed that the major activity during this stage was the approval of charters from the various governments and the arrangement of the financing for a railway over the White Pass.

The second time in Whitehorse's history that this stage occurred was from 1938 to 1942. This period was characterized by a search for the best alternative route for the Alaska Highway. Again, decisions were made by the federal governments of the United States and Canada, resulting in the signing of agreements, setting of specifications and financing for the route. In all four periods that these communities were in the *Prospecting to Survey Stage* economic impact for the community during Stage II was minimal. This is due to the fact that decisions made in the southern metropolises determined the future of the single-enterprise community.

The reason very little economic benefit is felt in the community is that approvals for right of ways, mineral rights and a myriad of other regulations must be satisfied before a corporation is willing to invest large sums of money in remote areas. Private capital, therefore, does not enter the community without some assurance of return. This period was also the time when corporations began to evaluate

the findings of their engineers and consultants to determine the economic feasibility of a project.

The third stage in the development of a single-enterprise community, *Industrial and Town Construction*, was experienced twice by both communities. The first periods of Stage III in Whitehorse was, 1898-1899 and in Yellowknife it was 1937 to early 1938. In the case of Whitehorse this stage began with the construction of the railway in 1898. The community of Whitehorse was established on the west bank of the Yukon at the site of the rail head. Housing and warehousing were built in the town to facilitate railroad construction and provide stakes for the miners. In Yellowknife this stage started when Consolidated Mining sank their first vertical mine shaft. Koroscil describes Yellowknife townsite in 1937:

At this point in time, Yellowknife was a small airplane terminal comprised of three buildings and a series of tents. (Koroscil 1975, 124).

Both Communities experienced this stage again around the time of the Second World War. In the case of Whitehorse the second Stage III occurred in 1942 when the Alaska Highway was built and the Canol Pipeline was constructed. In the period 1946-1948, when Giant Yellowknife Mine was being constructed, Yellowknife experienced a second Stage III. This Stage III was different from the Stage III of the initial development. Since a townsite already existed, this stage largely comprised industrial construction. The community and a basic level of services already existed when

this second period of industrial construction commenced, and it would seem more logical that the community or town moved directly to the community improvement stage.

Unfortunately there was no empirical evidence in the form of census data to support or quantify the economic characteristics of Stage III and IV in Whitehorse and Yellowknife, which necessitated the use of data from other communities. Fort McMurray was the best documented of present day resource communities and although the available data refers to the third time Fort McMurray has experienced Stage III, the data will at least provide some evidence of the labour force characteristics of Stage III.

The *Industrial Construction Stage* of Fort McMurray for which data were available coincided with the construction of the Syncrude Tar Sands Plant between the periods 1972 to 1978. The first comparable data available were for 1977. The labour force during this period was characteristic of a single-enterprise community where the majority of the labour force is dependent on one industry for its livelihood. In Fort McMurray, 33.2 per cent of the labour force were dependent upon construction employment (Table 2). This is well above the cut-off used by Wilson in his study of Australian mining communities where he discovered that 87.5 per cent of all single-enterprise (mining) communities in Australia had greater than 32 per cent of their labour force employed in mining. Stage III, the first boom period, was characterized by a dominant construction industry.

TABLE 2

Labour Force by Industry, Fort McMurray: 1977-1980

Standard Industrial Classification	Stage III - 1977 #	Stage III - 1977 %	Stage IV - 1978 #	Stage IV - 1978 %	Stage IV - 1979 #	Stage IV - 1979 %	Stage IV - 1980 #	Stage IV - 1980 %
All Industries	9,184	100.0	10,897	100.0	12,524	100.0	13,226	100.0
Agriculture, Forestry, Fishing & Trapping	10	0.1	20	0.2	19	0.2	28	0.2
Mines, Quarries, & Oil Wells	1,931	21.0	4,004	39.6	4,258	34.0	4,732	35.8
Manufacturing	58	0.6	50	0.4	69	0.6	67	0.5
Construction	3,050	33.2	1,873	18.3	1,790	14.3	2,307	17.7
Transportation, Comm. & Other Utilities	417	4.5	442	4.1	473	3.8	560	5.0
Trade	763	8.3	1,134	10.4	1,317	10.5	1,546	11.7
Finance, Insurance & Real Estate	458	5.0	528	4.8	402	3.2	393	3.0
Community, Business & Personal Services	675	7.3	1,041	9.6	1,255	10.0	1,362	10.3
Public Administration	869	9.5	1,562	14.3	1,732	13.8	1,980	15.0
& Defense								
Unspecified & Undefined	953	10.4	248	2.3	1,209	9.7	151	1.1

Source: New Town of Fort McMurray Municipal Census 1977, 1978, 1979, 1980

In the case of Fort McMurray, the construction had been on-going for five years by 1977 and a variety of community and government services were already established. Because the period of construction of the tar sands plant was six years construction workers moved to Fort McMurray and brought their families with them. The duration of construction for the tar sands plant may be an exception to most mining communities since the sinking of a mine shaft and the installation of the necessary ancillary facilities will take twelve to twenty-four months depending on size.

In the case of Yellowknife, Consolidated Mining started a mine shaft in the summer of 1937 and in the early part of 1938 started production, pouring the first ingot on September 5, 1938. For Whitehorse, the construction of the White Pass railway took just over two years to complete. It is most unlikely that for such short periods, twelve to twenty-four months, construction workers would disrupt their families by relocating in a remote and temporary location with inadequate services.

Stage IV, Industrial Operation and Community Improvement, brings to life the industrial operation of the single-enterprise which was the 'raison d'etre' of the community. Economically, Stage IV is still a construction phase, but construction of the industrial plant has been completed to a point that the plant is operational. In Stage IV the dominant industry and employer is the single-enterprise of the community. In this stage, the

second largest employer will be the construction industry. Whitehorse experienced this stage at least twice, in 1899-1900 and again in 1942-1944 during the Second World War. Yellowknife also experienced this stage twice in 1938-1939 and again in 1945-1948.

In the case of the two case studies, no data were available for the four periods in question and Fort McMurray data will be used to provide some evidence for this stage in development.

Table 2 presents data by industry for Ft. McMurray for the years 1977-1980. The data for the years 1978, 1979, and 1980 represent the data for Fort McMurray during Stage IV. With the start of industrial operation in 1978, 2,073 jobs relating to the tar sands operation were added to the labour force. This increase plus the decline of construction workers by 1,177 made 39.6 per cent of the labour force directly dependent upon tar sands extraction for their employment. Construction, although still important to the economy, became the second largest employment sector with 18.3 per cent of the labour force dependent on construction for jobs.

In the next two years, 1979 and 1980, construction activity accounted for 14.3 per cent and 17.5 per cent of the labour force; while Mines, Quarries and Oil Wells employed 34.0 per cent and 35.7 per cent of the labour force in 1979 and 1980, respectively. During Stage IV, the dominant economic activity shifted from Construction to the

single-enterprise the community was founded to extract. Although the Construction and in this case Mines, Quarries and Oil Wells Groups, are the most striking in terms of employment a more subtle change is also occurring during this stage. The retail and wholesale trade sector of the economy as well as the Community, Business and Personal Services Sector is expanding. During Stage III, Trade employed 8.9 per cent of the labour force or 763 people. Between 1977 and 1980 this sector increased by 102.6 per cent resulting in 1,546 employees in the 1980 labour force. The Services Group increased from 675 to 1,362 employees in this period. This doubling of employment in the Service Group and Trade Group is characteristic of Riffel's Stage IV, in that Services are well-established prior to Stage V.

One of the trends which occurred in the Fort McMurray labour force between 1977 and 1980 was an increase in employment in the Public Administration sector. The increase of 118.2 per cent over the three years was most likely more typical of newer single-enterprise communities which were planned and serviced much better than earlier single-enterprise communities. There was a much more active role for government in the provision of social and health services in Fort McMurray. The government also provides employment through various regulatory agencies involved with the control of the industry. This includes safety inspections, pollution control and monitoring of output for royalty purposes. Hopefully, government participation and

involvement in single-enterprise communities has only begun and will be even greater in the future.

The *Industrial and Community Operation Stage* in Whitehorse occurred in 1900-1938 and again in 1944-1953. In Yellowknife, Stage V occurred in 1939-1943 and 1948-1967. The employment data which was available for Stage V was for Yellowknife. Employment by industry for Whitehorse in 1951 was unavailable.

Table 3 presents data for Stage V for the community of Yellowknife in 1951 and 1962. The labour force declined from 1,438 to 1,354 in 1962, largely due to the closure of mines in the Yellowknife area. Despite the decline in the labour force the general structure of employment changed very little. The relative and absolute level of mining employment declined but mining remained the dominant employer with 43.9 per cent of the 1962 labour force employed in mining. The major growth in employment in this period was in the Service Sector. In 1951 Community Business and Personal Services was the second largest employer, followed by Public Administration the third largest employer, each accounting for approximately ten per cent of the labour force.

By 1962 with increased government participation in the north, Public Administration and Defense had grown to 15.9 per cent of the labour force and Community Business and Personal Services employed 14.8 per cent of the labour force. Although these two sectors grew substantially during this period, Mining remained the dominant community

TABLE 3

Labour Force by Industry, Yellowknife: 1951 and 1962

Standard Industrial Classification	1951 Stage V #	1951 Stage V %	1962 Stage V #	1962 Stage V %
All Industries	1438	100.0	1354	100.0
Agriculture	3	0.2	2	0.1
Forestry, Fishing, Trapping & Logging	17	1.2	21	1.5
Manufacturing & Construction	105	7.3	90	6.7
Mining	813	56.5	595	43.9
Trans., Comm. & Other Utilities	102	7.1	113	8.5
Trade	65	4.6	96	7.1
Finance, Insurance & Real Estate	19	1.3	20	1.5
Community, Business & Pers. Services	157	10.9	202	14.8
Public Administration & Defense	147	10.2	215	15.9
Not Stated	10	0.7	-	-

Source: Bourne, 1963, pp. 52.

employer. During Stage V there appears to be some growth of a second industry but the single-enterprise remains the dominant industry upon which all else depends.

Stage VI, *Community Diversification* is a stage which, although desirable from the perspective of the community, is often difficult to achieve because of remote locations, hostile environments or a lack of commitment from a second major employer. From the perspective of the continuance of the community this may be critical, particularly if the community is dependent on a mine with a known life span.

Whitehorse achieved economic diversification in 1953 when the territorial capital was moved to Whitehorse. This move gave the community a sense of permanence and a viable commitment from the government. The government brought with it a requirement for a labour force not dependent upon the international commodities market, and therefore provided a cushion for the economy during periods of market place instability.

Similarly, Yellowknife received its economic diversification by its proclamation as territorial capital in 1967. Data in Table 4 presents labour force information by industry for Whitehorse in 1961 and 1971 (and Yellowknife in 1971). With the diversification of the economy, no enterprise accounts for more than thirty-two per cent of the labour force and because government was the secondary industry there was a boom in the Community Business and Personal Services Group. This group showed increases due to

TABLE 4

Labour Force of Whitehorse: 1961 and 1971 and for Yellowknife: 1971

Standard Industrial Classification	Whitehorse 1961		Whitehorse 1971		Yellowknife 1971	
	#	%	#	%	#	%
All Industries	2342	100.0	5220	100.0	2905	100.0
Agriculture	2	0.1	5	0.1	5	0.2
Forestry, Fishing, Trapping & Logging	7	0.3	35	0.7	15	0.5
Mines, Quarries & Oil Wells	99	4.2	390	7.5	575	19.8
Manufacturing	57	2.4	100	1.9	45	1.5
Construction	232	9.9	395	7.6	150	5.2
Trans., Comm. & Other Utilities	314	13.4	775	14.8	295	10.2
Trade	339	14.5	705	13.5	200	6.9
Finance, Insurance & Real Estate	42	1.8	155	3.0	60	2.1
Community, Business & Pers. Services	576	24.6	1170	22.4	610	21.0
Public Administration & Defense	587	25.1	790	15.1	610	21.0
Not Stated	87	3.7	700	13.4	350	12.0

Source: Statistics Canada, Census of Canada, 1961 and 1971.

the services which governments buy from the private sector.

There appear to be four or five main groups which emerge during this stage, Public Administration and Defense, employing 25.1 per cent and 15.1 per cent of Whitehorse's 1961 and 1971 labour force respectively. In Yellowknife in 1971, the largest employers were the Public Administration and the Community Business and Personal Services Group with each employing twenty-one per cent of the labour force. Community Business and Personal Services in Whitehorse employed 24.6 per cent of the 1961 labour force and 22.4 per cent of the 1971 labour force. Mining declined to 19.8 per cent of the labour force of Yellowknife by 1971. Transportation, Construction and Utilities, the main labour force activity in Whitehorse in 1951 had declined to 13.4 per cent of the 1961 labour force. The Trade Group and Transportation, Communication and Utilities Group increased during this period to approximately double the Stage V levels.

The four major expansion groups in the economy between Stage V and Stage VI were Public Administration and Defense, Community Business and Personal Services, Trade and Transportation, Communication and Utilities. These four groups, along with the single-enterprise which founded the community, dominated the labour force, accounting for approximately seventy per cent of the labour force. These four groups will be the major growth industries during Stage VI and a decline of the proportion of employment in the

primary single-enterprise will continue from Stage V with very little growth or perhaps even decline.

By contrast, the growth rates in employment will increase substantially in the four major groups mentioned previously. In the case of Yellowknife the growth in Public Administration and Defense was 184 per cent in the nine years between 1962 and 1971. Community Business and Personal Services Group increase 202 per cent in this period; Trade increased 108 per cent and Transportation, Communication and Utilities increased 161 per cent. Mining, the single-enterprise for which Yellowknife was founded, showed a decline of 3.4 per cent in this period.

Stage VII, *Community Maturity*, is the final stage in the development of a single-enterprise community. Riffel states that this stage takes the longest to achieve.

In terms of quality of living, this stage may also be the most crucial, for this is the stage in which feelings of community and belonging now emerge. Some sociologists suggest that this takes about three generations to achieve. It seems paradoxical that the quality of being in a town would become most satisfying at the time when one could expect that resources around which the town was built become depleted. (Riffel, 1975, 11).

One further qualification which must be added to this statement is that the three generations must occur after Stage VI. This is because in Stages I-V there is such high labour turnover that three successive generations could not have stayed in the community. Without continuity of families and individuals the community could not reach maturity. It

is unlikely that Whitehorse and Yellowknife have attained this stage. Table 5 shows the composition of the labour force of Grande Prairie, Whitehorse and Yellowknife in 1971. Grande Prairie will be used as an example of a mature community which is a regional centre in northwestern Canada.

Several differences are immediately apparent. The over-representation of the government sector in Yellowknife and Whitehorse, where the proportion of the labour force in public administration is almost double that in Grande Prairie. The under-representation of Trade in the Yellowknife and Whitehorse communities, with only 6.9 per cent and 13.5 per cent of the labour force involved in Trade. Grande Prairie, by contrast, had 21.7 per cent of the employed involved in Trade.

The under-representation of secondary activity, in Yellowknife and Whitehorse is quite dramatic. The wholesale sector in Grande Prairie in 1971 was 30.5 per cent of the trade sector. Grande Prairie was obviously a wholesaling centre for the region. Whitehorse was also a wholesale centre for the region with 25.7 per cent of the Trade sector involved in the wholesaling function. Yellowknife, however, had only 9.8 per cent of its Trade sector involved in the wholesaling function.

TABLE 5
Labour Force Activity by Industry for Yellowknife, Whitehorse and Grande Prairie: 1971

Standard Industrial Classification	Whitehorse #	Whitehorse %	Yellowknife #	Yellowknife %	Grande Prairie #	Grande Prairie %
All Industries	5,220	100.0	2,905	100.0	5,975	100.0
Agriculture	5	0.1	5	0.2	65	1.1
Forestry, Fishing & Trapping	35	0.7	15	0.5	115	1.9
Mines, Quarries & Oil Wells	390	7.5	575	19.8	55	0.9
Manufacturing	100	1.9	45	1.5	715	12.0
Construction	395	7.6	150	5.2	675	11.3
Trans., Comm. & Other Utilities	775	14.8	295	10.2	600	10.0
Trade	705	13.5	200	6.9	1,295	21.7
Finance, Insurance & Real Estate	155	3.0	60	2.1	235	3.9
Community, Business & Pers. Services	1,170	22.4	610	21.0	1,635	27.4
Public Administration & Defense	790	15.1	610	21.0	530	8.9
Unspecified & Undefined	700	13.4	350	12.0	50	0.8

Source: Statistics Canada, Census of Canada, 1971.

E. CONCLUSION

To summarize the finding of this Chapter, a graph (Figure 4) has been prepared to exemplify the changes in employment which occur during the stages of development. During Stages I and II, when the native economy persists, there is a dominance of the traditional economy of hunting, fishing and trapping. The community could be characterized as a single-enterprise community of hunting, fishing and trapping during Stages I and II. Economically there is little difference between stages I and II.

In Stage III, the first period of white dominance, the community becomes a single-enterprise community based on construction employment. In Stage IV, the community remains a single-enterprise community but employment is now primarily in the single-enterprise and construction is a secondary employer. When all construction is completed, the community is dominated by the single-enterprise and Community, Business and Personal Services Group are the secondary employer. Stages IV and V appear to be very similar.

An introduction of another major employer occurs in Stage VI. In many instances, this will involve the government sector, as well as an increase in the Trade Group, Transportation and Communication Group, and Community, Business and Personal Services Group takes place. Stage VII reveals further diversification in Manufacturing and Trade, particularly in the Wholesaling sector. This may

reflect that the single-enterprise communities under consideration have not yet reached the *Maturity Stage*.

Having established that there are economic stages as measured by employment, these stages will be used as reference periods in the demographic chapter to establish if the demographic characteristics correspondingly display four stages in development as well.

V. DEMOGRAPHIC CHARACTERISTICS OF SINGLE-ENTERPRISE TOWN DEVELOPMENT

A. INTRODUCTION

Single-enterprise communities have experienced shifts in the demographic composition of the population. Demographically, the single-enterprise community, because of its high turnover creates an age-sex structure which is reflective of this mobility. The age-sex structure of single-enterprise communities is similar to new towns, both of which are a reflection of the age-sex distribution of migrants.

Much like the organization of Chapter Two, we will deal with the stages of development for Whitehorse and Yellowknife and then summarize and compare the demographic characteristics of these stages. Fort McMurray, Grande Prairie and Grande Cache will be included in this section of the chapter as examples of the demographic characteristics of single-enterprise communities during the construction and maturity stages.

B. YELLOWKNIFE: DEMOGRAPHIC CHARACTERISTICS OF DEVELOPMENT

The demographic characteristics of the various stages of development as outlined by Riffel appear to move from low turnover and a balanced age-sex structure in Stage I to a peak in turnover and imbalanced masculinity in Stage III. A decline in turnover and a normalizing of the age and sex

structure occurs through the remaining stages of development.

The lack of indigenous population in the area, or at least the industrial plant's requirements for labour being in excess of the supply of the area, results in in-migration. The first major wave occurs in Stage III when construction of the industry and town begin. This stage exhibits the highest labour turnover. A second wave of in-migration occurs when the construction labour force leaves the community and the industrial plant workers arrive. Stage IV, with commercial and residential construction, will produce more in-migration as services are added and employment in support services become available. By the time the community and industry is operational, labour turnover is reduced to 60 per cent and when community diversification occurs labour turnover stabilizes at thirty-five per cent (Riffel, 1975, 13). Community maturity reduces the rate of labour force turnover even further.

The chronology of the developmental stages established for Whitehorse and Yellowknife in Chapter 2 will be used as the reference periods for discussion of the demographic characteristics. The *Natural or Pre-discovery Stage* in Yellowknife was pre-1926 when committed exploration and prospecting started in the Yellowknife area. During this period there was no settlement at Yellowknife and the area was largely uninhabited. Across Yellowknife Bay, approximately five kilometers from the present site of

Yellowknife, was an Indian village. In 1962, Bourne estimated the village had a population of one hundred. The population of the Northwest Territories consisted primarily of Native Indians and Inuit; the white population was comprised of a small number of fur traders and their families. The white population was, however, heavily out-numbered by the native population.

Stage II of Riffel's model states that the area remains isolated and white residents are short term and seasonal in nature. The prospecting groups are small numbers of young men, no women, and the native people form the majority of the population. With the current movement of women into various occupations which were traditionally male, such as geology and engineering, it is possible that women may be among contemporary prospecting groups.

In the case of Yellowknife, this stage was almost exactly as Riffel describes in his model. In 1926, Cominco sent a team of six men into the Great Slave Lake area. Prospecting during the next three summers resulted in commercial discoveries of minerals, however, the inaccessibility of the area hampered the exploitation of the mineral resources which were discovered.

The depression of the 1930's interrupted exploration in the Yellowknife area; however in 1934, with a new form of transportation, the airplane, exploration continued. The first surface showing of free gold was discovered by a prospecting party the following year. Exploration by a

variety of prospectors continued through 1936. The dominant population in the area remained the Native Indians and Inuit.

The relatively short duration of the *Industrial and Town Construction Stage* is due to the relatively short time required to sink a mine shaft. During this period the town's population increased to about 800. (Rae, 1964, 289). This population was predominantly male as construction was an industry dominated by males in the late 1930's. The substandard services most likely inhibited families from moving to the area. Due to the occupations, the era and the isolation of the area migrants were predominantly single young adults. The separation of the head of the family from the wife and children probably kept turnover very high. Although the native population in the Northwest Territories still formed a majority, the migrant white settlers were a definite majority in the community of Yellowknife.

During Stage IV the permanent mining labour force moved into Yellowknife. Several mines came into production during this time and the townsite was enlarged by nearly twice its original size. The population grew from 800 during the construction phase to approximately 1,000 during community improvement. The major thrust in this stage of development was the expansion of commercial services. The federal government also invested in local improvements, including a water distribution system.

Yellowknife development was disrupted in 1939 when the Second World War started. The war caused prospectors to search for minerals critical to the war effort. The second major impact of the war was the resultant shortage of labour. Despite this shortage two mines came into production in 1941 and 1942. The following year the labour shortage became more severe and the population of Yellowknife declined to 200. In the fall of 1944, the labour shortage partially due to the war effort, caused the closure of the last operational mine in Yellowknife.

In the autumn of 1943 a new discovery of gold near Yellowknife started a new *Prospecting Stage*. The majority of the prospecting occurred in the summer of 1944 and 1945. This brought only temporary residents to the area interested in finding the mother lode. These were 'get rich quick and get out' migrants. The closure of the last operating mine during this period left a small base population of perhaps 200 in Yellowknife. By 1945 an estimated 22,000 people were prospecting in the Yellowknife region. (Rae, 1964, 303)

This period with the slackening of labour and equipment limitations saw mines coming into production again and renewed planning for construction of new mines. Because the mines and town existed and were ready to become operational, the *Industrial and Town Construction Stage* did not occur in Yellowknife when the second wave of development occurred. The influx of migrants attracted to Yellowknife in 1945 brought the problem of adequate services to the attention of

the federal government. In 1945, a new townsite was surveyed and planned. This stage of development was characteristic of Stage IV, (*Community Improvement*).

The dramatic growth of the Yellowknife population quickly demonstrated the inability of the present townsite to accommodate growth of both business and residential structures. As well, the federal government had in the post-war period acquired a new attitude to northern development and was willing to attempt making the north more attractive and livable. The new townsite was surveyed and planned some two and one-half kilometers inland from the Old Town. The movement of commercial and residential activities to the new town was completed in 1947 when some 100 new buildings were erected.

Having gone through a second boom, Yellowknife stabilized and by 1948 the emphasis was on the production of gold. The population of Yellowknife also stabilized and growth declined to 2.5 per cent per annum between 1951 and 1962. This population growth cannot be tied to increased economic activity because the labour force declined by six per cent during this period. The population growth was created by miners bringing their families to Yellowknife. During Stage V the sex ratio declined from 184 to 117. The decline is accentuated if the sex ratio of singles over fifteen years of age is considered. The sex ratio for the single population declined from 613 males for every 100 females in 1951 to 233 males to every 100 females in 1966.

The decline in the sex ratio over this fifteen year period is the result of several factors. The north in the 1950's, was for the most part considered remote, isolated, under-serviced and climatically unattractive. Communities in northern Canada also had a stigma of impermanence about them. The commitment of the federal government during this period also helped remove the stigma of impermanence by making Yellowknife a Municipal District in 1953 and a town in 1963. The inaccessibility of the north and dependence on air transport was reduced in the post-war years with construction of roads to both Yellowknife and Whitehorse from northern Alberta and B.C.

Perhaps the most important stage in development for a single-enterprise community is *Industrial Diversification* (Stage VI). The reason that this stage is important, is the impact it has on turnover. Labour turnover is cut almost in half from Stage V and there is usually an increase in population as the new industry fulfills its labour requirements. Normally this industry requires very different occupations in its labour force. Stage II through VI can be associated, therefore, with continual migration.

The growth of Yellowknife during Stage VI (1966-1971), averaged 12.8 per cent per annum compared to 2.5 per cent per annum during Stage V. The level of growth will of course depend upon the secondary industry, its demand for labour, and the kind of spin-off effects it can generate in the economy of the community. The growth rate of Yellowknife

declined to 7.0 per cent per annum between 1971 and 1976. The commitment of the government, as well as the perceived permanence of Yellowknife added new population and provided a stability not previously present in the settlement.

It is unlikely that enough time has passed for Yellowknife to have reached maturity. The increase in population in Stage VI has brought a new set of migrants to the community and these migrants have not had enough time to develop the commitment to the community which is required to achieve a sense of community or belongingness. Mobility is most likely a poor indicator of community belongingness; the age and sex structure is more likely to provide a better indication of community commitment.

C. WHITEHORSE: DEMOGRAPHIC CHARACTERISTICS OF DEVELOPMENT

Demographically, the development of Whitehorse is similar to that of Yellowknife despite the fact that settlement started 38 years earlier in Whitehorse. Dependent upon transportation which was in turn dependent upon gold mining, the community reflected the vagaries of the gold mining industry until the Second World War.

The Yukon in the *Pre-discovery Stage* was inhabited by Inuit and Indian peoples. The Native tribes of the Yukon, the Kutchin, the Nahami and the Taglish, were hunters and fishermen whose livelihood dictated a nomadic way of life. The Taglish Indians were known to camp around Whitehorse for periods of three or four weeks in the summer. The Northwest

Company had established trading posts in the north and the traders were the only other population in the area. The native population was small and scattered. They followed the seasonal and migrational patterns of the wildlife, establishing camps for short durations then moving on.

During this stage, in 1885 through 1896 small groups of placer miners were producing gold in the Yukon. Their numbers were small until the 1896 discovery of the richest gold deposits in the Yukon on Bonanza Creek by George Carmack. (Koroscil, 1970, 42) This discovery and the rush which resulted brought about the second stage in the development of Whitehorse.

The *Prospecting to Survey Stage* in Whitehorse was essentially the search for a short overland route to the Klondike. Unlike the development of most single-enterprise communities, this stage saw a massive influx of settlers, bent on making money fast and getting out. The magnitude of the boom can be attributed, in part, to the very small capital outlay required for placer mining to return a profit.

Estimates vary, but upwards of 100,000 people set out for the Klondike in 1897; of these only about 40 per cent actually reached the Klondike gold fields in 1898. During this period the White Pass was discovered and a wagon road cut. The lower summit and easier grade made the White Pass more conducive to winter travel. In Whitehorse, a settlement of tents and log cabins was established on the east bank of

the river. The settlement was a depot for miners on their way into the Klondike. The vast majority of migrants going to the Klondike came via Whitehorse.

Normally the *Construction Stage* causes the first major migration boom, but the relatively low capital requirements and the lucrative return resulted in the major boom occurring during the *Prospecting to Survey Stage*. It is unlikely that another migration flow like the Klondike will ever occur again. Whitehorse was experiencing the regional impact of the gold boom but had little hope of survival as a community after the gold was mined out.

In May of 1898, construction of the White Pass and Yukon Railway was started from Skagway. During the winter of 1898-1899 the buildings from Closeleigh on the east bank of the Yukon river were moved to the present site of Whitehorse. The community began to expand as supplies and people began to move through Whitehorse to the Klondike. The *Construction Stage* of Whitehorse coincided with the peak of migration with an estimated 40,000 people in the Yukon.

By February of 1899, the railway had been completed to the summit of White Pass. A regular service into Whitehorse was established with rail service augmented by horse-drawn cart over the last half of the right of way. During this period the town was surveyed and the community grew to about 1,000 people.

The completion of the railway in 1900 brought Whitehorse into the *Industrial and Community Operation*

Stage. With warehousing in place, Whitehorse now replaced Dawson City as the major distribution centre of the Yukon. The addition of a steam ship service to Dawson City in 1900 assured the continuance of Whitehorse as a permanent settlement. During this period the population of Whitehorse declined from 1,000 to a low of 331 in 1921. As a result of increased tourism in the late 1920's, the 1931 population had increased to 541. Whitehorse continued to act as the supply centre for the Yukon but the decline of gold production lowered the demand for freight services to this remote area.

Whitehorse reached Stage V by 1900. The railroad had continued to function despite the poor economic conditions of the early 1900's. By 1938, a new *Prospecting to Survey Stage* was underway. It was during this stage that consideration was being given to building a new highway to Alaska. A number of routes were considered and in 1941 a decision to build the highway through Whitehorse was reached. By 1941, the population of Whitehorse had grown to 754.

The construction of the Alaska Highway began in early 1942 and was completed in November 1942. During this period the population of Whitehorse reached approximately 35,000. This influx of population was predominantly male, because the military, responsible for building the highway, was primarily male.

November, 1942 through 1944 saw a shift to industrial operation and community improvement. The large population of Whitehorse attracted private investment and facilities and services were expanded and improved. The population of Whitehorse remained at its high point of 35,000 during this stage.

By 1944, the War had shifted to favor the allied forces and the military forces present in Whitehorse began returning to the United States. Lotz, using military records estimated the population in 1944 declined to approximately 8,000 and by the end of 1945 the population declined to 3,680. By 1951 the population showed a further decline to 2,724. The community now had three fully operational transportation networks to increase its distribution functions. This stage lasted until 1953 when the capital of the territory was moved to Whitehorse.

Community Diversification occurred in 1953 and this brought with it a new demand for labour. Although the 1956 Census shows a decrease of population by 24 persons there are circumstances which suggest the population of Whitehorse was in fact expanding during this period. During the Second World War there was limited control over the land uses surrounding the town of Whitehorse. A number of squatter areas developed as did subdivisions along the Alaska Highway. Two areas adjoining Whitehorse in 1956 but outside the municipal boundaries, were Mocassin Flats and Whiskey Flats.

Data collected for a planning study by J.R. Lotz, in 1961 indicated that the combined population of Whiskey Flats and Mocassin Flats was 1,115 and the population of Upper Whitehorse was 558. Army and Air Force camps contained about 2,700 people. The 1956 population of Whitehorse and adjacent area was approximately 4,243, not including an additional 2,700 armed forces personnel. Controlling for annexations prior to 1961, the community had grown substantially between 1951 and 1956.

In 1961 the Mocassin Flats and Whiskey Flats areas were included in the Census, bringing the population of Whitehorse City to 5,031. By adjusting this figure to include the population of Upper Whitehorse, 725 in 1961, the population of the Whitehorse area increased to 5,558. The average annual growth rate between 1951 and 1956 was 12.7 per cent indicating a major growth in population due to migration. The growth rate declined to 5.1 per cent per annum between 1956 and 1961.

The 1966 Census population figure shows a population decline of 14.2 per cent from 5,558 in 1961. This population decline was most likely due to a suburban movement from Whitehorse proper to the surrounding suburban areas. In the late 1960's, an annexation occurred and the 1971 population of Whitehorse increased to 11,217. The 1976 population was 13,311 and the average annual growth rate of 3.7 per cent per annum between 1971 and 1976 is more indicative of the growth in Stage VI as this population is inclusive of the

combined suburban and central growth of Whitehorse.

From 1953 to 1981 not enough time had passed for three successive generations to have lived in Whitehorse and therefore the sense of community, indicative of Stage VII, may not have developed. Demographically, this stage could be better described as a stage in which growth of the community is more dependent on natural increase than migration and the age-sex structure shows signs of aging.

D. DEMOGRAPHIC CHARACTERISTICS OF DEVELOPMENT

As stated in the introduction to this chapter the sex ratios, age structures, life cycle stages, marital status and migration status of Yellowknife and Whitehorse will be examined within the context of each stage of development. The text is organized not by variable but by development stage. In the use of longitudinal data it is important to realize that the data reflects changes over time. The availability of data also influences the ability to summarize the stages of development, and the data must be interpreted with consideration for the changes in society as a whole.

The demographic characteristics of the *Natural or Pre-discovery Stage* will be characterized by the age structure of the Northwest Territories in 1931. Although Census data are available for 1921 the integrity of the data is suspect because of poor reporting practices and substantive changes in age-sex reporting between 1921 and

1931.

Table 6 presents the age and sex structure of the population of the Northwest Territories in both 1921 and 1931. The 42.4 per cent of the population which did not give its age are most likely Natives. In both years, 1921 and 1931, the age-sex pyramid reflects a population with high birth rates, high death rates and low net migration. Most of the population growth is attributable to natural increase and the population pyramid derives its shape from this combination of vital events.

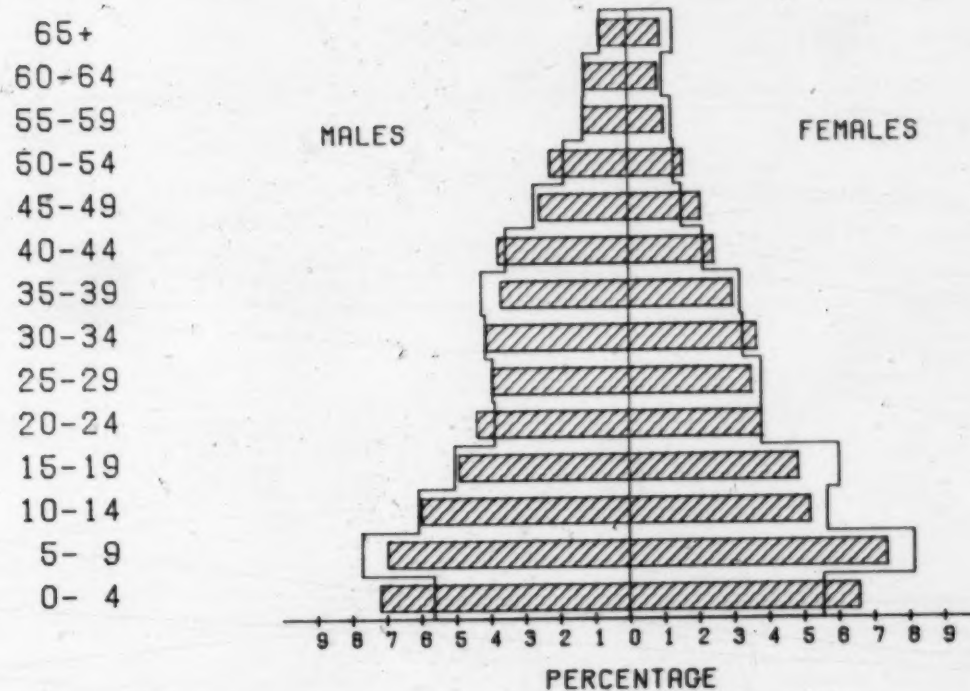
The pyramid, as evident from Figure 5, is broad based with a slight indentation in the 0-4 age groups. This group may reflect high infant mortality. Each age group from 5-9 through 65+ then decreases slightly, indicative of increasing age-specific mortality. The growth rate of the population was 1.1 per cent during the 1921-1931 period, most likely due to natural increase. The index of dissimilarity for these two stages was 4.8, indicating that the two populations are not dissimilar. The most significant difference in the two stages is the increase of the sex ratios from 107 in 1921 to 116 in 1931. This increase in the sex ratio is not attributable to the prospectors entering the Northwest Territories during this period because their numbers were very small. It is more likely attributable to the improved census reporting in 1931.

The similarity of the 1921 and 1931 population supported the demographic characteristics of Stage I and II

TABLE 6
Age and Sex Distribution for Northwest Territories: 1921 and 1931

Age	1921			1931		
	Total #	%	Male #	Total #	%	Female #
All Ages	7,988	100.0	4,129	51.7	3,859	48.3
0-4	517	11.2	261	5.6	256	5.5
5-9	733	15.9	357	7.6	376	8.1
10-14	542	11.7	281	6.1	261	5.6
15-19	510	11.0	233	5.0	277	6.0
20-24	354	7.7	179	3.9	175	3.8
25-29	357	7.7	182	3.9	175	3.8
30-34	343	7.4	192	4.2	151	3.3
35-39	344	7.4	197	4.3	147	3.2
40-44	262	5.7	164	3.5	98	2.1
45-49	196	4.2	126	2.7	70	1.5
50-54	146	3.2	86	1.9	60	1.3
55-59	117	2.5	60	1.3	57	1.3
60-64	104	2.3	59	1.3	45	1.0
65+	97	2.1	37	0.8	60	1.3
Not Stated	3,366	42.2	1,715	21.5	1,651	20.7
					171	1.8
					80	0.8
					91	1.0

Source: Dominion Bureau of Statistics, Census of Canada, 1921 and 1931



 N.W.T. 1921
 N.W.T. 1931

Figure 5

Age-Sex Structure, Stage I of Development,
Northwest Territories 1921 and 1931

as described by Riffel. The *Natural or Pre-discovery Stage* is characteristic of no population or small bands of native peoples. In 1921, 98.3 per cent of the population of the Northwest Territories was Native. This proportion declined to 89.6 per cent in 1931, the native population remaining very much in the majority. The population involved in gold prospecting in 1931 consisted of a small group of men working during the summer. Unfortunately, demographic data for the Yukon during the first two stages is very limited, consisting of estimates of total population.

The construction phase of both Whitehorse and Yellowknife occurred in an intercensal period and therefore data from another community will be used to characterize this stage of development. A community in the northwest part of Canada which was in the construction phase during a census period is Fort McMurray. During both 1966 and 1976, the community was undergoing a construction stage. The first, in 1966, was the period during the construction of the Great Canadian Oil Sands (G.C.O.S.) plant, (now Suncor Ltd.) and the second period was the construction of the Syncrude Tar Sands Plant. It is important to note that the community was experiencing both Stage V and III during both time periods mentioned. In 1966, the community was a transportation centre for shipping to northern Alberta and the Territories. In 1976, the community was in Stage V with the operation of the Suncor plant.

In view of the complexity of this situation a few cautionary notes are in order. First, the census does not report temporary residents as part of the population. This means the construction workers housed at the construction site outside the community would not be included in the population totals presented here. Second, given the duration of the construction stage of a tar sands plant, 4 years for the G.C.O.S. plant, and 6 years for the Syncrude plant, the construction workers most likely brought their families to the town of Fort McMurray. This situation may be unique to communities where construction requires lengthy periods to complete the industrial plant. Third, modern single-enterprise communities, especially those developed after 1970, may be attracting a different type of population than earlier single-enterprise communities. With the involvement and commitment of governments, there appears to be a compression of the stages into a shorter time frame.

Stage III in Fort McMurray in both 1966 and 1976 had a very different population from those of the first two stages of development. Table 7 and Figure 6 present these two age-sex distributions. Unlike the regular decline in each age group 5-9 through 65+ shown by the Stage I and II age-sex pyramid, Fort McMurray starts on a very broad base of 13.2 per cent of the population aged 0-4 in 1976 and 16.2 per cent aged 0-4 in 1966, decreasing in each age group until it reaches the 20-24 age group. The 20-24 age group shows an increase in both age-sex structures of

TABLE 7
Age and Sex Distribution, Fort McMurray: 1966 and 1976

Age	1966				1976			
	Total #	%	Male #	Female #	Total #	%	Male #	Female #
All Ages	2,614	100.0	1,471	1,143	15,425	100.0	8,050	7,375
0-4	423	16.2	229	194	2,030	13.2	1,010	1,020
5-9	328	12.6	166	162	1,930	12.5	960	970
10-14	267	10.2	150	117	1,600	10.4	790	810
15-19	195	7.4	105	90	1,375	8.9	700	675
20-24	262	10.0	116	146	1,900	12.3	945	955
25-29	220	8.5	132	88	1,965	12.7	1,005	960
30-34	194	7.4	121	73	1,475	9.6	815	660
35-39	165	6.3	100	65	1,035	6.7	585	450
40-44	144	5.5	84	60	720	4.7	340	280
45-49	108	4.1	66	42	475	3.1	275	200
50-54	103	3.9	61	42	390	2.5	215	175
55-59	71	2.8	46	25	250	1.6	145	105
60-64	57	2.1	43	14	145	1.0	90	55
65+	77	3.0	52	25	135	0.9	80	55

Source: Statistics Canada, Census of Canada, 1966 and 1976.

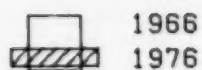
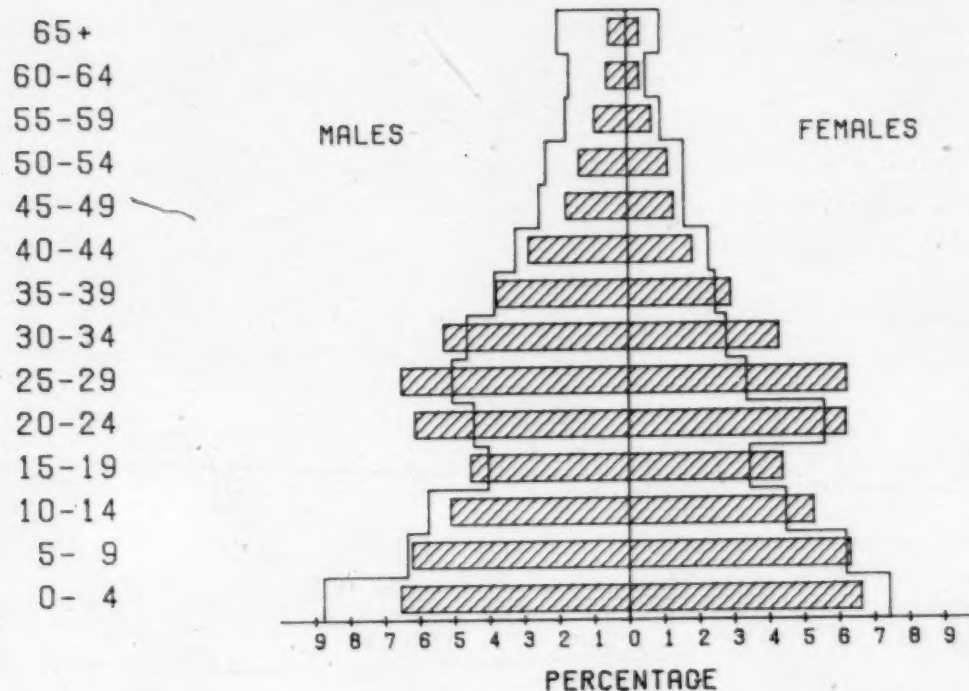


Figure 6
 Age-Sex Structure, Stage III of Development,
 Fort McMurray 1966 and 1976

approximately three per cent over the previous five year age group.

The two age structures differ in the 25-29 age group. Where the 1966 age structure begins to show decline with each five year age group, the 1976 age structure increases in the 25-29 year age group to 12.7 per cent of the total population. The 30-34 year age group is the beginning of the declining five year age cohorts showing steady decline with increased age in the 1976 age structure. There was also a higher proportion of people aged sixty-five and over in 1966 than in 1976; three per cent in 1966 compared to less than one (0.9) per cent in 1976.

The sex ratio reported for the community in 1966 and 1976 was 129 and 109 males per 100 females, respectively. These figures do not include the single men living in the construction camps near Fort McMurray. Inclusion of the workers residing at the construction camps would increase the sex ratio. The one thing which is immediately apparent is the decrease in the sex ratio over the five year period between 1956 and 1961 and the general decline between 1951 and 1976 for all of the communities.

Pressman, Bourne, Robinson, Marsh and Lucas all refer to the extreme masculinity of these communities. These studies have a common methodological strain. Each study compares the sex ratios of a number of resource towns at a given point in time. Robinson compared Elliot Lake, Drayton Valley, Kitimat and Schefferville for the year 1956. Bourne

TABLE 8

Sex Ratios for Selected Single-Enterprise Communities: 1951-1976

Year	Yellow-knife	White-horse	Fort McMurray	Grande Cache	Drayton Valley	Scheffer-ville	Kitimat	Elliot Lake
1951	184	120	114	N/A	-	-	-	-
1956	155	118	145	N/A	143	318	251	119
1961	131	114	119	N/A	112	145	120	115
1966	117	107	129	N/A	107	128	118	110
1971	118	111	110	115	106	113	116	108
1976	110	112	109	112	-	-	111	109

Source: Statistics Canada, Census of Canada 1951, 1956, 1961, 1966, 1971, 1976.

N/A - Not Available

compares these communities for 1961. Table 8 presents the sex ratios for the communities of Whitehorse, Yellowknife, Fort McMurray, Grande Cache, Drayton Valley, Schefferville, Kitimat and Elliot Lake for the historical period 1951 through 1976.

The sex ratio of the single-enterprise community is declining over time. From the general trends portrayed in the table, it appears that the communities which started in the 1970's do not have as severely imbalanced sex ratios as those which started earlier. It would appear the dominance of males in resource communities has declined over the years. The lowering of the sex ratio appears more immediately in the modern resource community than in the communities which started earlier in the century. Although the stages may be occurring, the implication is faster movement through the stages with an indication of more permanent population, particularly families, moving into these communities.

This, however, does not negate Riffel's model, which suggests mostly single men in Stage III. The *Construction Stage* of Fort McMurray (1966 and 1976), does not reflect this for two reasons. First, construction workers resident at Syncrude's camp would not be reported in the Fort McMurray population and second, the length of the construction period in Fort McMurray has caused a lot of construction workers to bring their families with them.

This decline in the sex ratio points toward more stable single-enterprise communities. Supporting this historical decline is the reduction of the number of singles in the population in conjunction with the increase in married population. Generally, Table 9 shows earlier and later single-enterprise communities have changed with time. There is a decrease in the proportion of population over age fifteen who were single in Fort McMurray and Yellowknife. In both communities the decrease in unmarried population is paralleled by an increase in the proportion of the population who are married.

Whitehorse, during this period 1951-1976 has shown very little change in the marriage pattern of the community. Fluctuating from a low of 64.5 per cent of the population over fifteen being married in 1976, to a high of 69.0 per cent in 1971, there is very little to indicate that the single population of Whitehorse has decreased over time. This may be because Whitehorse, as a single-enterprise community based on transportation and having been in existence for some fifty years by the time of this study's first measurement, had achieved a sense of community or permanence. Koroscil identified the Second World War as providing the final impetus of Whitehorse's permanence as a community.

Although the traditional single-enterprise community was male dominant, the single-enterprise community of the seventies has changed to a community with a more balanced

sex ratio. The decline of the proportion of males in these communities population does not necessarily refute Riffel's model, but places more emphasis on the stage of development. Although Riffel characterizes the *Industrial and Town Construction Stage* as "mostly single men" it could be better described. A more accurate description, at least for the modern single-enterprise community, would be, that the single population is dominated by males.

Table 10 presents the sex ratios of the single population over fifteen years of age. Both Whitehorse and Yellowknife have had a decline in the sex ratio of the single population between 1951 and 1971. Whitehorse had a slight increase in the sex ratio of unmarried population between 1966 and 1971. Yellowknife showed a decline in the single sex ratio in each five year period from a high of 613 in 1951 to 173 in 1971. Fort McMurray had an increase in the single sex ratio between 1961 (Stage V) and 1966 (Stage III). The shift of the labour force into predominantly construction activity in the 1963-1967 period most likely attracted a large number of young single males to work on the construction of the Suncor Tar Sands Plant. The increased single sex ratio in Stage III, 1966, was 247, compared to Stage V, 1961, when the single sex ratio was 163. In 1971, after construction of the tar sands plant was completed, the plant was operational and construction was a secondary employer to mining, the sex ratio declined to 180 single males to every 100 single females.

TABLE 10

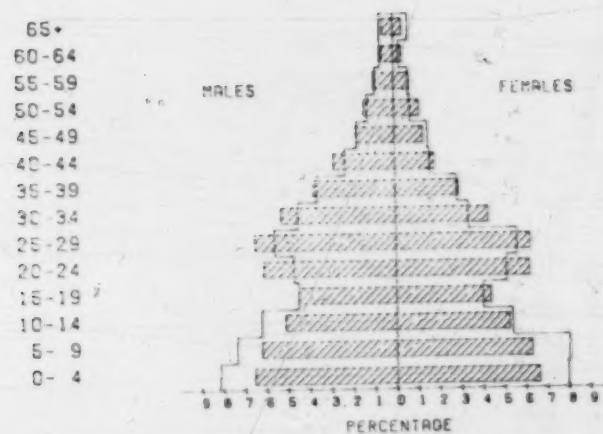
Sex Ratios of Single Population Age 15 and Over
Fort McMurray, Whitehorse and Yellowknife: 1951-1971

Community	1951	1956	1961	1966	1971
Fort McMurray	N/A	N/A	163	247	180
Whitehorse	192	193	175	141	151
Yellowknife	613	444	354	233	173

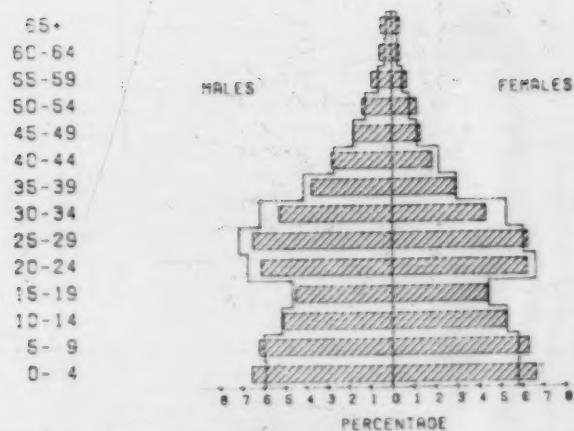
Source: Statistics Canada, Census of Canada, 1951, 1956, 1961, 1966, 1971.

Industrial and town construction in the older resource communities was dominated by males whereas the modern resource community is dominated by young workers with families. During Stage III the sex ratio of the single population will increase significantly as single construction workers move to the community to construct both industrial plant and community facilities. Fort McMurray during Stage III, 1976, reflects the other major demographic characteristic identified by Riffel. The high rates of population mobility identified by Riffel were reflected in sixty-five per cent of the 1976 population being new migrants to Fort McMurray.

Stage IV, the *Industrial Operation and Community Improvement Stage*, will be characterized by Fort McMurray in 1971 and 1979. Table 11 displays the age and sex structure of Fort McMurray in 1971 and 1979. These age and sex distributions show very slight change from the 1976 age-sex structure. The index of dissimilarity between the 1971 and 1976 age-sex structures is 4.2 indicating the two structures are very similar, despite the fact that they represent two unique groups of people. The 1976 Census of Canada shows principally construction workers and their families, whereas the 1979 Municipal Census displays primarily operating staff of the Syncrude and Suncor Tar Sands Plants. Although there is a complete change of some 3,000 families this does not appear to result in a very significant difference in the age-sex structure. (See Figure 7)



1971
1976



1979
1976

Figure 7

Age-Sex Structure, Stage IV, Fort McMurray 1971 and 1979
Compared With Stage III, Fort McMurray 1976

Figure 8 provides a comparison of Stage IV and V single-enterprise communities age distribution with the age distribution of Millwoods. The graphic presentation was used to portray the age-sex similarities between a new town in southern Canada and Stage IV and V single-enterprise communities.

From the Figure it appears that the age structure of the new town is very similar to the age structure of the single-enterprise communities in Stages IV and V. The most significant differences appear in the 0-9 and 30-39 age groups. In the 0-9 age group the early single-enterprise communities seem to have lower percentages of population which is compensated for in the higher percentages of the population in the 30-39 age group. As stated earlier there is a good possibility that Stage III of community construction is very similar to this when the duration of construction is extended over a period of three or more years.

Both of these age structures, 1976 and 1979, display the characteristics of a population influenced by a significant volume of migration. The early maturity group, who are typically migrants (McVey, 1978, 20) aged 25-44 comprise 36.6 per cent of the Fort McMurray population in 1979, 33.7 per cent in 1976, and 27.7 per cent in 1966. The age structures are typical of communities receiving the modern Canadian migrant. In 1971, the early maturity group represents 37.1 per cent of all migrants in Canada. By 1976,

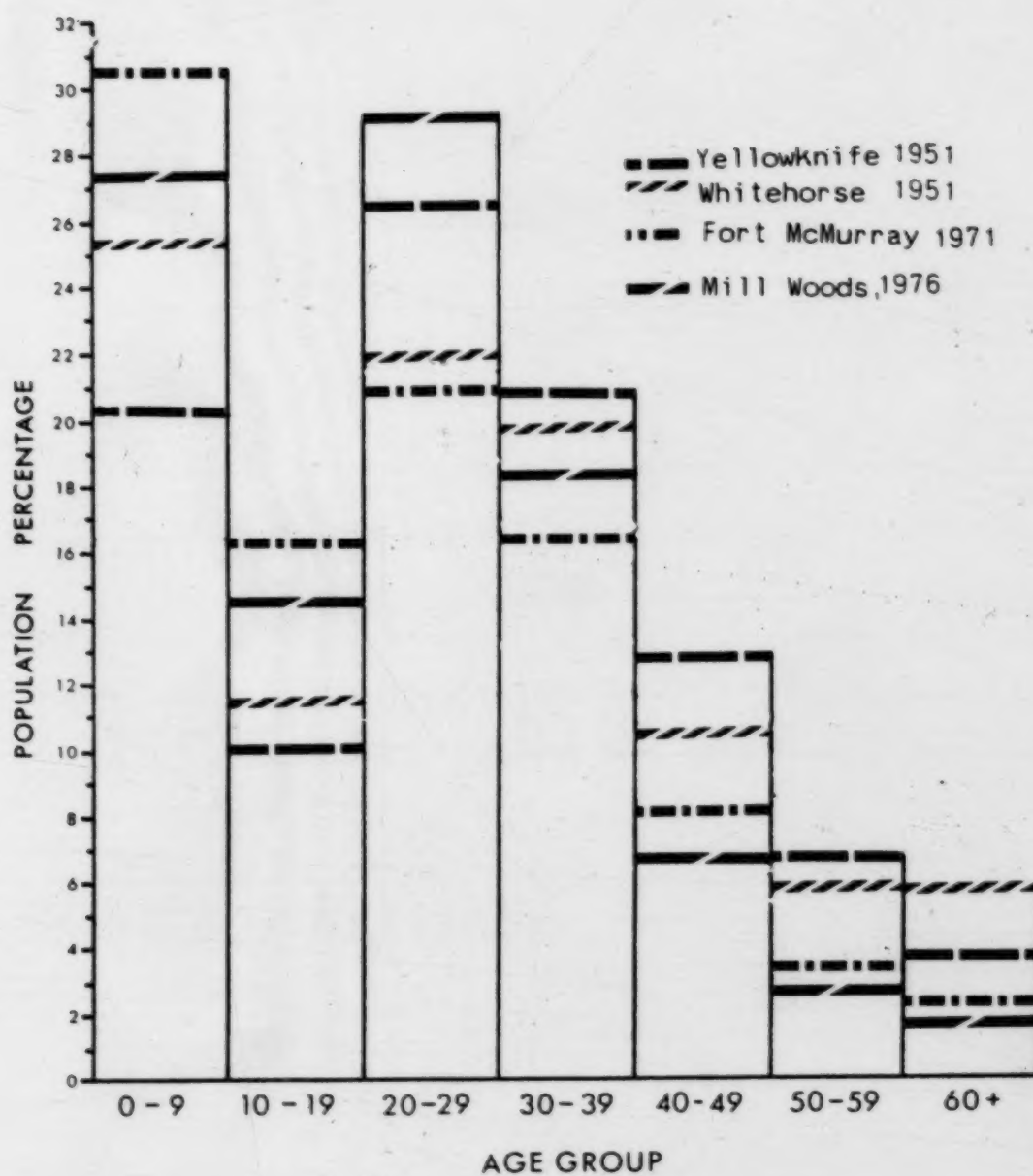


Figure 8

Age Structure, Canadian New Town, Mill Woods,

Compared to Stage IV and V Single-Enterprise Communities

28.1 per cent of all migrants were between the ages of 25-44.

A study of migrants to small communities in Alberta, found that thirty-six per cent of all migrants were in the early maturity life cycle stage. (McVey, 1978, 20). These migrants to Alberta communities of population less than 30,000 also had a high proportion of their population in the childhood ages of 5-14, some 24.5 per cent. Nationally, 22.2 per cent of all migrants were aged 5-14 in 1966, and in 1976 this figure was reduced to 19.5 per cent of all migrants. In 1966, 1976, and 1979, the 5-14 age group was 22.8 per cent, 22.9 per cent and 22.3 per cent of the total Fort McMurray populations respectively.

The 1979 Fort McMurray population, according to the Municipal Census, was over-represented by children ages 0-14 and people in their early maturity life cycle stage. The late maturity, retirement and youth life cycle stages are under-represented, a pattern reflective of migrants.

The youth life cycle stage, age 15-24, is peculiar because the two five year age groups 15-19 and 20-24, show a consistent pattern in all three of the populations of Fort McMurray during Stage III and IV. In 1966 the 15-19 age group had 195 people in it and comprised 7.4 per cent of the total population. In 1976, during construction of the Syncrude plant the 15-19 year olds had increased to 1,375 and represented 8.9 per cent of the total population. During Stage IV, 2,132 people in Fort McMurray were 15-19 years of

age and comprised 9.1 per cent of the total population.

The 20-24 age group increased from ten per cent in 1966 to 12.3 per cent in 1976 and to 13.4 per cent in 1979. The 20-24 age group was consistently larger than the 15-19 age group. This pattern is inconsistent with the natural aging trend of populations. Normally with increased age, the risk of death increases and the number of people in the older age group is usually numerically less than in the younger age group.

The late maturity life cycle stage (45-64 years of age) had only 6.5 per cent of the Fort McMurray population in it and the retirement life cycle stage (65 and over) had 0.4 per cent of the 1979 population in it. Comparing these figures to the late maturity and retirement life cycle of 1971 and 1976 Canadian migrants; both groups are under-represented in the Fort McMurray populations. In both 1971 and 1976 Canadian migrants in the late maturity life cycle accounted for 11.9 per cent of all migrants. The retirement life cycle stage represented 4.6 per cent and 5.0 per cent of all Canadian migrants in 1971 and 1976 respectively.

The lack of population in the latter stages of the life cycle could be due to the attractiveness of the single-enterprise community to a young labour force. These are not communities people move to for retirement. They are attractive to young people and young families because of the employment opportunities. The population is therefore over

represented with population in the early life cycle age groups.

Stage IV, the *Industrial Operation and Community Improvement Stage* has continued high mobility. There has been a complete turnover of the labour force as the major construction labour force leaves the community and is replaced by the labour force working in the single-enterprise. No figures are available to indicate the absolute size of the turnover but from the Fort McMurray Municipal Census the approximate size of the construction labour force living in Fort McMurray can be estimated. In 1976, the labour force working in construction amounted to thirty-five per cent of the labour force or 2,659 people. In 1979 this figure was reduced to 1,764 people or seventeen per cent of the total labour force employed in construction. Syncrude and Suncor had a combined labour force of 4,189 residents in 1979. This was forty per cent of the total 1979 labour force compared to twenty-three per cent of the labour force in 1976.

Migration to communities of single-enterprise and the continual turnover of labour is a well-documented problem. Siemens, Riffel, Robinson and Lucas all point out the high labour turnover of these communities. The only mobility statistics available for Stage IV were for Fort McMurray during 1971. In that year the community residents over age five who were not resident in Fort McMurray five years earlier, accounted for 73.2 per cent of the total

population. Migrants whose place of residence in 1966 was outside of Canada numbered 490 or 8.4 per cent of the total population. Although they are a small proportion of the total population the single-enterprise community is still an attractive community for immigrants.

As mentioned in the discussion of sex ratios, the Stage IV sex ratio of singles showed a decline in comparison with Stage III. The age structures in Stage III and IV show very little change. The majority of population remain in the childhood and early maturity life cycle stages and the youth, late maturity and retirement life cycle stages are under-represented in the population. The childhood and early maturity groups combined, accounted for 72.7 per cent of the 1971 population, 69.6 per cent of the 1976 population and 70.4 per cent of the 1979 population of Fort McMurray. The indices of dissimilarity which will be discussed later in this chapter support the proposition that the demographic differences between Stages III and IV are very minor.

Communities in Stage V, *Industrial and Community Operation*, tend toward reduced rates of turnover and lower mobility rates with young married workers forming the majority of the population. This tends to be true for the modern single-enterprise community as well as the earlier single-enterprise community. Despite relatively high sex ratios in 1951, both Yellowknife and Whitehorse populations were dominated by married population. Approximately fifty-four per cent of Yellowknife's 1951 population was

married. The corresponding figure for Whitehorse in 1951 was sixty-nine per cent. Fort McMurray also in Stage V in 1951, had sixty-two per cent of the population aged fifteen and over married. The major difference between the modern single-enterprise community and the earlier single-enterprise community is that the dominance of young married population occurs at an earlier stage of development. In the case of Fort McMurray, the 1966 population (Stage III) already had a population dominated by young marrieds (69.7 per cent).

The age and sex distribution of the early single-enterprise community are characteristic of Fort McMurray 1951, 1956, 1966; Yellowknife 1951, 1956, 1961, 1966; and Whitehorse 1951. The sex ratio of these early single-enterprise communities support the literature which indicated these communities were male-dominated. The sex ratios of the early Stage V communities were as high as 184 (Yellowknife 1951) and as low as 114 males to 100 females (Fort McMurray 1951).

The sex ratio and its decline over time may be indicative of the perceived permanence of the community for families. The earlier communities of Whitehorse and Yellowknife did not, even in the *Industrial and Community Development Stage* instill enough confidence in their permanence for people to bring their families into the frontier. This era, during the 1950's and 1960's, was also a period of questioning the merits of the "company town" and

its associated problems.

Stage V in the growth and development of a single-enterprise community shows a reduced population growth rate. The rate of growth will be directly related to the growth in the labour force. The growth rates during Stage V may be negative. For example, the partial closure of a mine will cause the labour force to decline and, hence, the population. The growth rate shown in Table 12 averaged 2.5 per cent per annum in Yellowknife over the fifteen years between 1951 and 1966. This is a substantive change from the growth rates of Stage III and IV where average annual growth rates were 17.4 per cent per annum (Stage IV, Fort McMurray) and in Stage III even higher. Fort McMurray's average annual growth rates were 4.0 per cent between 1951 and 1961 (Stage V) and 1.4 per cent in the latter half (1956-1961) of this stage.

Whitehorse during Stage V (1911-1941) shows a pattern of population growth similiar to Fort McMurray and Yellowknife in Stage V. The average annual growth rate between 1911 and 1921 was 5.5 per cent. In the next ten year period, from 1921-1931, the average annual growth rate was 6.3 per cent and from 1931 to 1941, the average annual growth rate was 3.9 per cent. Although the growth rates are fairly high, the relatively small population base is accentuating them.

The age-sex distributions of these early single-enterprise communities, (Table 13), will be discussed

TABLE 12
Population Growth Rates, Stage V,
Fort McMurray: 1951-1961, Yellowknife: 1951-1966,
and Whitehorse: 1911-1941

Year	Population	Percentage Change	Average Annual Growth Rate
Fort McMurray			
1951	926		
1951-56		19.9	4.0
1956	1110		
1956-61		6.8	1.4
1961	1186		
Yellowknife			
1951	2724		
1951-56		13.8	2.8
1956	3100		
1956-61		4.7	0.9
1961	3245		
1961-66		12.2	2.4
1966	3745		
Whitehorse			
1911	727		
1911-21		-54.4	-5.5
1921	331		
1921-31		63.4	6.3
1931	541		
1931-41		39.4	3.9
1941	754		

Source: Statistics Canada, Census of Canada 1911-1966.

TABLE 13
Age and Sex Distribution During Stage V, for Yellowknife, 1951-1966, Whitehorse, 1951, Fort McMurray, 1961

All Ages	Yellowknife 1951				Yellowknife 1956				Yellowknife 1961			
	Male	%	Female	%	Male	%	Female	%	Male	%	Female	%
All Ages	1,766	64.83	958	35.17	1,885	60.80	1,215	39.20	1,840	56.70	1,405	43.30
0-4	178	6.53	173	6.35	245	7.90	217	7.00	267	8.23	249	7.67
5-9	113	4.15	87	3.19	153	4.93	142	4.58	224	6.90	190	5.86
10-14	63	2.31	54	1.96	95	3.06	86	2.77	134	4.13	128	3.94
15-19	99	3.63	58	2.13	105	3.39	81	2.61	102	3.14	65	2.00
20-24	284	10.43	92	3.38	254	8.19	130	4.19	149	4.59	123	3.79
25-29	223	8.19	112	4.11	267	8.61	128	4.13	186	5.73	134	4.13
30-34	191	7.01	125	4.59	209	6.74	123	3.97	191	5.89	136	4.19
35-39	159	5.84	93	3.41	137	4.42	97	3.13	149	4.59	98	3.02
40-44	116	4.26	69	2.53	133	4.29	83	2.68	110	3.39	87	2.68
45-49	127	4.66	34	1.25	83	2.68	43	1.39	89	2.74	71	2.19
50-54	84	3.08	26	0.95	74	2.39	40	1.29	68	2.50	49	1.51
55-59	56	2.06	16	0.59	57	1.84	22	0.71	58	2.10	35	1.08
60-64	36	1.32	8	0.29	31	1.00	8	0.26	42	1.29	14	0.43
65+	37	1.36	11	0.40	42	1.35	15	0.48	48	1.45	26	0.78

All Ages	Yellowknife 1966				Whitehorse 1951				Fort McMurray 1961			
	Male	%	Female	%	Male	%	Female	%	Male	%	Female	%
All Ages	2,016	53.89	1,725	46.11	1,417	54.63	1,177	45.37	645	54.38	541	45.62
0-4	253	6.76	272	7.27	213	8.21	180	6.94	110	9.27	86	7.25
5-9	281	7.51	248	6.63	143	5.51	117	4.51	87	7.34	80	6.75
10-14	203	5.43	195	5.21	96	3.70	85	3.28	77	6.49	66	5.56
15-19	148	3.96	151	4.04	41	1.58	72	2.78	49	4.13	54	4.55
20-24	143	3.82	121	3.23	118	4.55	109	4.20	31	2.61	24	2.02
25-29	154	4.12	142	3.80	161	6.21	170	6.55	35	2.95	43	3.63
30-34	164	4.38	124	3.31	152	5.86	134	5.17	34	2.87	25	2.11
35-39	168	4.49	124	3.31	128	4.93	101	3.89	36	3.04	35	2.95
40-44	118	3.15	92	2.46	98	3.78	71	2.74	42	3.54	26	2.19
45-49	105	2.81	81	2.17	71	2.74	35	1.35	23	1.94	34	2.87
50-54	73	1.85	67	1.79	64	2.47	37	1.43	20	1.69	28	2.36
55-59	76	2.03	44	1.18	33	1.27	18	0.69	32	2.70	8	0.67
60-64	43	1.15	22	0.66	35	1.35	19	0.73	21	1.77	14	1.18
65+	87	2.33	32	0.86	64	2.47	29	1.12	48	4.05	18	1.52

Source: Statistics Canada, Census of Canada, 1951, 1956, 1966

in terms of the life cycle stages of the residents. These early communities reflect the labour turnover addressed in the summary of Stage IV. In all cases the percentage distribution of population in the various life cycle stages remains stable. Although the population is growing very slightly there are no signs of normal aging. Instead of an aging process the turnover seems to attract people of similar demographic composition to the community thereby giving the population pyramid the same shape. This population is typically younger and in the child bearing ages, giving the community high fertility potential. The pyramid starts with a broad base of children and narrows to the 15-19 age group, then expands from age group 20-24 on, this is referred to as the "pinched waist effect." This pattern shows up in the 1951, 1956 and 1961 age-sex pyramids of Yellowknife and Whitehorse 1951. The rather irregular shape of Fort McMurray's age-sex structure, Figure 9, is unusual and can be better understood when the life cycle stages are considered.

Table 14 displays the life cycle stages of the early single-enterprise communities during Stage V. The communities show a similar pattern. All communities are over-represented by the childhood and early maturity life cycle stage and under-represented in the youth, late maturity and retirement life cycle stages. The pattern is very similar to that of migrants, new towns and the modern single-enterprise community in Stages III and IV.

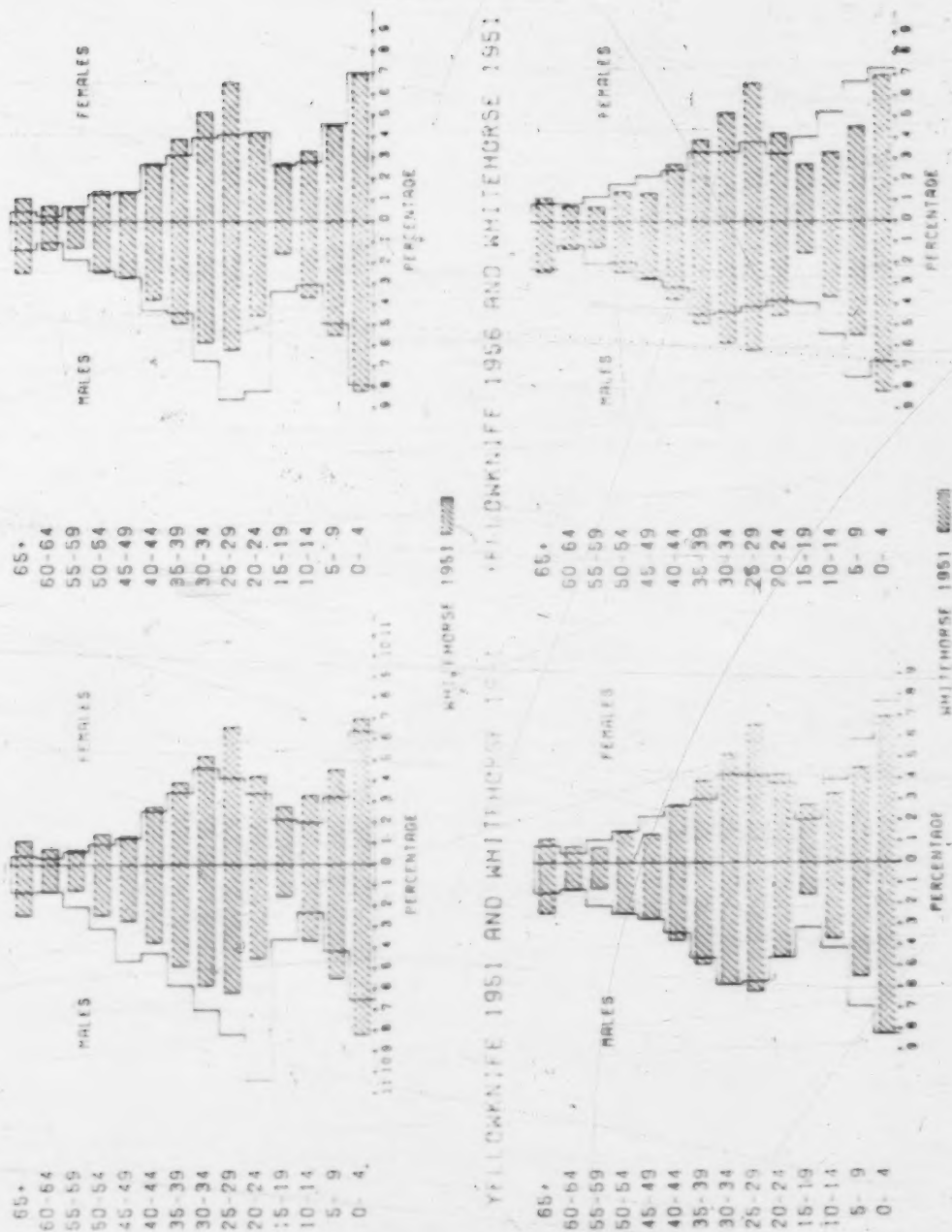


Figure 9
Age-Sex Structure, Whitehorse 1951,
Yellowknife 1951-1966

TABLE 14
Life Cycle Stages of Study Communities in Stage V of Development 1951-1966

Life Cycle Stage	Fort McMurray 1951						Fort McMurray 1956						Fort McMurray 1961						Whitehorse 1951					
	Total			Male			Total			Male			Total			Male			Total			Male		
	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%
Childhood 0-14	255	41.3	20.3	21.1			414	37.2	20.4	16.8			506	41.7	22.6	19.1			834	32.2	17.4	14.7		
Youth 15-24	86	13.9	7.8	6.2			161	14.5	8.5	5.9			158	13.0	6.6	6.4			340	13.1	6.1	7.0		
Early Maturity 25-44	148	24.0	12.6	11.3			287	25.8	14.9	10.9			276	22.8	12.1	10.6			1015	39.1	20.8	18.4		
Late Maturity 45-64	99	16.0	9.6	6.5			197	17.7	11.7	5.8			206	17.0	7.9	9.1			312	12.0	7.8	4.2		
Retirement 65+	29	4.7	2.8	1.9			53	4.8	3.5	1.3			66	5.4	4.0	1.5			93	3.6	2.5	1.1		

Life Cycle Stage	Yellowknife 1951						Yellowknife 1956						Yellowknife 1961						Yellowknife 1966					
	Total			Male			Total			Male			Total			Male			Total			Male		
	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%	#	%	%
Childhood 0-14	667	24.5	13.0	11.5			938	30.3	17.5	15.8			1192	36.7	19.3	17.5			1452	38.8	19.7	19.1		
Youth 15-24	533	19.6	14.1	5.5			570	18.4	12.8	7.5			439	13.5	7.7	5.8			563	15.0	7.8	7.3		
Early Maturity 25-44	1088	39.9	25.3	14.6			1177	38.0	26.5	15.3			1091	33.6	19.6	14.0			1086	29.0	16.1	12.9		
Late Maturity 45-64	387	14.2	11.1	3.1			113	11.5	8.7	4.0			449	13.8	8.6	5.2			521	13.9	7.9	6.0		
Retirement 65+	48	1.4	1.4	0.4			15	1.8	1.5	0.5			74	2.3	1.5	0.8			119	3.2	2.3	0.9		

Source: Statistics Canada, Census of Canada, 1951, 1956, 1961, 1966.

The indices of dissimilarity shown in Table 15 reflect a change in modern single-enterprise communities compared to earlier single-enterprise communities. Modern single-enterprise communities in Stage III and IV exhibit different age-sex distribution than earlier Stage V single-enterprise communities. Modern resource communities had little age-sex variation between Stages III, IV and V.

The modern single-enterprise community in Stages III and IV shows significant differences from earlier single-enterprise communities in Stage V but little difference from modern single-enterprise communities in Stage V. The modern single-enterprise communities vary in dissimilarity very slightly 6.83 in 1971 and 4.09 in 1976. They exhibit very similar age structures despite the differences in stage of development. Fort McMurray was in Stage IV in 1971 and Stage III in 1976 while Grande Cache was in Stage V in both years.

In terms of the age structure, the major differences appear to be in the late maturity, retirement and youth life cycle stages. The modern single-enterprise community is devoid of population in the retirement and late maturity life cycle stages. The earlier single-enterprise communities' late maturity life cycle group had between 11.5 per cent and 17.7 per cent of the population in this life cycle stage while the modern single-enterprise community has between 3.5 per cent and 7.7 per cent of its population in the late maturity life cycle stage. Retirement population

TABLE 15

Modern Single-Enterprise Communities Compared to Earlier
Single-Enterprise Communities

Fort McMurray 1971, Stage IV Compared to Stage V Communities

Index of Dissimilarity

Yellowknife 1951	21.35
Yellowknife 1956	15.38
Yellowknife 1961	12.60
Whitehorse 1951	16.23
Fort McMurray 1951	13.71
Fort McMurray 1956	15.96
Fort McMurray 1961	14.58

Fort McMurray 1976, Stage III Compared to Stage V Communities

Index of Dissimilarity

Yellowknife 1951	15.04
Yellowknife 1956	10.39
Yellowknife 1961	12.85
Whitehorse 1951	13.98
Fort McMurray 1951	18.71
Fort McMurray 1956	17.53
Fort McMurray 1961	19.35

Fort McMurray 1971 and 1976 Compared to Grande Cache
1971 and 1976

Index of Dissimilarity

Fort McMurray 1971 and Grande Cache 1971 (Stage V)	6.83
Fort McMurray 1976 and Grande Cache 1976 (Stage V)	4.09

varied from 1.8 per cent to 5.4 per cent in the early single-enterprise communities, while the modern resource community's retirement population varied from 0.4 per cent to 1.3 per cent of the population. Controlling for stage, the youth life cycle stage appears to have increased in the modern single-enterprise community, ranging from 18.4 per cent to 21.2 per cent of the population. In earlier communities the youth life cycle stage varied from 13.0 per cent to 19.6 per cent.

The earlier communities in Stage V, although heavily influenced by migration caused by labour turnover, had more population in the older age groups, particularly those in the late maturity life cycle. The modern single-enterprise community had high sex ratios for single population but a much reduced sex ratio overall. The modern single-enterprise community was much more influenced by younger married populations.

In Stage VI, *Community Diversification* occurs when the labour force of the community reduces the employment dependency on the single-enterprise to below thirty per cent. During this period labour turnover stabilizes and young marrieds remain in the majority. The two communities of Yellowknife and Whitehorse have attained this stage. *Community Diversification* was due to location of the territorial governments in these communities thus expanding the public sector. The Census years for Whitehorse which reflect Stage VI were 1956, 1961, 1966, 1971 and 1976.

Yellowknife was somewhat later in achieving community diversification and the Census years which apply to Stage VI in Yellowknife are 1971 and 1976.

Table 16 displays the migration status of Yellowknife and Whitehorse during Stage VI, for both communities only data for 1971 and 1976 were available because of population size and changes in Census methodology. For comparison the table includes data for Fort McMurray 1971 and 1976, Grande Prairie 1971 and 1976, Camrose 1976, and Grande Cache 1976. Migration to communities declined during Stage VI in comparison to Stage III, IV, and V. Migrants and non-migrants were more evenly split in Stage VI while the Stage III, IV, and V communities were dominated by new migrants. The increase in non-migrant population is indicative of a stable community and implies permanence. These migration rates for Yellowknife and Whitehorse are still very high, in that about half the residents of these communities were not resident in the community five years prior.

The most important characteristic of Stage VI is the increase in the non-migrants, since this is indicative of community stability and commitment of the residents to remain in the community. The decline in the number of migrants relative to non-migrants indicates that the communities are in transition and moving towards maturity. Camrose was included to give an indication of migration rates in a mature community. In 1976, 66.0 per cent of the

Camrose population were non-migrants and 33.9 per cent were migrants. This is a direct reversal of the Stage III, IV, and V migration rates where 73.2 per cent, 64.3 per cent and 73.5 per cent were migrants and 26.8 per cent, 35.7 per cent and 26.4 per cent were non-migrants. Yellowknife and Whitehorse do not fit into either of these extremes, which indicates a transition is occurring from the *Industrial Operation Stage* to the *Maturity Stage*.

The age-sex structure also takes on a new shape. Instead of the pinched waist shape of stage III and IV, the pyramid changes. The 15-19 age group and the 0-14 age groups become very even with about ten per cent of the population in each group. The broadening of the 15-19 age group will also bring the percentage of population aged 15-19 to about 10 per cent, causing a diamond shape population pyramid.

Table 17 shows the age-sex structure of Yellowknife and Whitehorse during Stage VI. Examining the trends in Whitehorse's age-sex structure between 1956 and 1976, there is little change in the age-sex structure until 1971, some 18 years after the economic diversification occurred. The economic occupational diversification increased opportunity for female employment, but did not have a significant impact upon the population structure. It is most probable that the change to a more even distribution in the age-sex structure required a change in the perception people had of these communities before they were willing to make a commitment to them. For this reason only 1971 and 1976 data will be

considered for Stage VI for Whitehorse.

The major change which showed clearly in the life cycle stages was the increase in the youth group and the slight decline in the childhood group. The childhood group in the Stage V communities ranged from twenty to forty per cent of the population. The Stage VI communities, Whitehorse and Yellowknife 1971-1976, had a narrower range of population in the childhood life cycle stage, twenty-eight to thirty-five per cent. The youth life cycle stage shows increases in Stage VI over Stage V. In the Stage V communities the youth life cycle stages ranged from thirteen to twenty per cent of the population and in Stage VI the range was from 18.6 to 22.4 per cent of the population in the youth life cycle stage. The major differences between the modern single-enterprise community in Stage III through V and the Stage VI communities is the increase in older populations.

The late maturity and retirement life cycles, although still under-represented compared to southern communities showed increases over earlier stages of development of the modern single-enterprise communities. The late maturity group increased in the Stage VI communities to range from ten to thirteen per cent of the population in this age range compared to the modern single-enterprise community in Stages III, IV and V, ranging from three to eight per cent of the population in the late maturity group.

The retirement life cycle stage is very under-populated in the modern single-enterprise community, Stages III

through V ranging from 0.5 per cent to 1.3 per cent of the population in the retirement life cycle stage. The Stage VI communities showed a higher range in the retirement life cycle stage varying from 1.5 per cent to 2.3 per cent of the population being of retirement age. It should be noted that these ranges were about the same in Yellowknife and Whitehorse during Stage V. This indicates that *Community Diversification* is not a necessary prerequisite to population increases in the later life cycle stages. The youthful population and lack of amenities of the community may be important determinants of the willingness of older population to remain in single-enterprise communities.

The young married population remains in the majority during Stage VI, but in the modern single-enterprise community the young married population may decline during this stage. In the case of Fort McMurray and Grande Cache in Stages III through V, the married population was a higher proportion of the total population than the Stage VI communities; 73.9 per cent for Grande Cache in 1976, and 73.9 per cent and 75.3 per cent for Fort McMurray in 1971 and 1976 respectively. This is higher than the proportion of Whitehorse population married during Stage VI, 69.0 per cent and 64.5 per cent in 1971 and 1976 respectively. The proportion of married population in Yellowknife in 1971 and 1976 was 66.1 per cent and 63.5 per cent respectively.

The indices of dissimilarity shown in Table 18, show a difference existed between Yellowknife and Whitehorse in

TABLE 18

Indices of Dissimilarity for Communities in Stage V and VI

<u>Whitehorse</u>	<u>Index of Dissimilarity</u>	<u>Yellowknife</u>	<u>Index of Dissimilarity</u>
1976 and 1971	6.49	1976 and 1971	5.46
1976 and 1961	13.41	1976 and 1966	13.88
1976 and 1951	13.41	1976 and 1961	14.21
1971 and 1961	10.94	1976 and 1951	13.55
1971 and 1951	13.10	1971 and 1966	9.49
		1971 and 1961	10.23
		1971 and 1951	13.27

Stage VI and Yellowknife and Whitehorse in Stage V.

Because the communities being studied had not reached Stage VII, a scenario of what Stage VII might look like will be presented. Firstly, the sex ratio will oscillate around 100 or balance of the sexes. Two very significant changes will occur in the mobility status of the population. Non-migrants will increase to over sixty per cent of the population and non-movers, people who resided in the same dwelling five years ago, will increase to between thirty and forty per cent of the population. The source of migrants to these communities will change as well, the migrants from outside of Canada will be reduced to less than five per cent of total migration. Migration from the same province will increase substantially and become the major source of migrants. Migrants, drawn from other provinces will be reduced to a secondary source of population.

Very little difference is anticipated in the marital status of Stage VII versus Stage VI communities. The major increase in marital status groups will occur in the widowed population. The widowed population will increase because of increased aging in the population, differential mortality effects, and the increased familiarity of friends and relatives in the community causing widowers to stay in the community. Growth rates of the population will decline to less than two per cent per annum.

The life cycle stages will reflect the aging trend of the population and the childhood life cycle stage will be

reduced to levels lower than Stage VI. As the population matures, the population is less concentrated in the child bearing years, fertility decreases and the childhood life cycle stage declines. The proportion of total population in the late maturity and retirement ages increases as a proportion of total population. The retirement life cycle will also increase but in the north the climate may influence the absolute level to which the retirement life cycle can grow.

E. CONCLUSION

Demographically, there appears to be only four distinct stages of development. Stages I and II of the economic stages appear to be similar. Stages III, IV and V appear to have similar demographic characteristics, while Stages VI and VII appear fairly distinct.

The single-enterprise community has changed with a shift toward a balanced sex ratio. Domination of these communities by young married population is evident at an earlier stage of development. The age-sex structure of the community appears to be better described by four stages of development than seven. Migration and labour turnover appear to be better described by four stages as well. The single-enterprise community shows a marked similarity, in terms of its demography, to Millwoods. Finally, a relatively distinctive pattern of life cycles dominate these communities during Stage III, IV, and V. The childhood and

early maturity life cycle stages account for the majority of population.

VI. SOCIAL CHARACTERISTICS OF SINGLE-ENTERPRISE TOWN DEVELOPMENT

A. INTRODUCTION

The single-enterprise community has been studied most often in relation to its social problems. Frequently quoted results of these studies is that these communities are characterized by "poor living environment" or that they are "socially unstable". The first critical refutation of these pat answers to social problems in single-enterprise communities was by Larson in 1979. Studying personal and family adjustment in Fort McMurray, Larson pointed out the lack of research on social impact and human environment, defined as interpersonal relationships within families, and the lack of conclusive evidence to support the assumption that personal problems such as "cabin fever" among females even exists. (Larson 1979, 125-127)

Given that these statements bear some merit it is not surprising that Riffel gives a very brief, poorly documented, qualitative description of the social characteristics of his model. The social characteristics are ill-defined because the model was devised primarily to accommodate the economic stages of development. Riffel characterizes the stages of social development entirely in terms of the accessibility to the community and the development of community facilities and amenities. The *Natural or Pre-discovery Stage* is described as "Unpopulated

or small isolated native communities in limited contact with white society." (Riffel, 1975, 13). The prospecting to survey stage represents a minimal intrusion on the native society and very little changes from Stage I; except some tent or shack town developments, normally lacking amenities. Access is limited to air only.

Riffel summarizes the *Industrial and Town Construction Stage* as isolated, largely a trailer town and facilities or amenities limited to the "pub". Industrial operation and community improvement shows definite improvements in accessibility, roads and communication services are completed and housing and community facilities are improved. Social problems among whites are reduced and correspondingly increased among natives.

During industrial and community operation amenities are well-developed. Social problems among the white population are reduced, however, housewives face the problem of boredom. (Riffel, 1975, 13) Natives are on welfare and the community shows marked stratification. Community diversification provides local opportunities for housewives to enter the labour force and special programs are created to deal with native people's social problems. Community maturity is achieved when the community develops a sense of community and belongingness. Riffel does not define the concept of community maturity clearly, nor is it documented in his book. Welfare recipients are not predominantly natives. Racial tension is reduced. (Riffel, 1975, 13).

It is obvious from the description provided that the social characteristics of the single-enterprise town are very subjective and difficult to measure. Riffel also assumes that the community must have social problems because of isolation, contact with native cultures and poor communications.

The social characteristics will be presented in this chapter and will be organized in a similar manner as in the demographic and economic chapters. The descriptions of the early stages for each community will be followed by a chapter summary presenting an analysis of the enumeration area data for various stages of development.

B. YELLOWKNIFE: SOCIAL CHARACTERISTICS OF DEVELOPMENT

Although Riffel characterizes the *Natural or Pre-discovery* period as an "... unpopulated or small isolated native communities in limited contact with White society" (Riffel, 1975, 13). This period must be more precisely defined in order to understand the social changes which occurred during the transition from the native, rural community to the white, urban community.

Although Yellowknife was established in an area where the physical site was unpopulated, the introduction of a white urban society with its highly specialized differentiated role systems would obviously have had an impact on the native population. This would have resulted in a number of social problems as two very diverse social

systems are brought into contact with one another. During the *Natural or Pre-discovery Stage*, native populations in Yellowknife were typical of lesser developed countries, with an extended family kinship pattern, high birth and death rates, low life expectancy and high interdependence for survival. These communities required the support of their neighbours to hunt and share the available food. Strong kinship ties and interdependent relationships were necessary to assure existence. Community leadership was most likely informal and the population highly mobile, following the migratory patterns of the game. Contact with white society was limited to the Federal Indian Agents and the traders of the Hudson's Bay Company. Liquor, often a contemporary problem among natives, was not readily available.

During the second stage of development, the impact of development on the native society was minimal, because only small groups of short term residents had been in the area. Access to Yellowknife during this period was very difficult. Getting from Edmonton to Yellowknife took up to three weeks via rail to Waterways then barge to Lake Athabasca, then by boat to Fitzgerald, (near present day Ft. Smith) and by canoe across Great Slave Lake. In 1934, the introduction of air transport into northern areas made the area more accessible. Documented by records of Bear Exploration and Radium Limited and Consolidated Mining and Smelting, the seasonal prospecting teams were typically six to twelve men working through the summer months and returning to the south

during winter. These teams of men utilized tents and consequently, no permanent shelters were established until free gold was discovered. In 1936 the Corona Inn was the only building in Yellowknife; consisting of sleeping facilities for twelve and catering primarily to prospectors.

Industrial and Town Construction began in 1937 and Koroscil describes Yellowknife as "...a small airplane terminal comprised of three buildings and a series of tents." (Koroscil, 1975, 124). Access to Yellowknife did not improve during this period, but the tent camp does give an indication of the perceived impermanence of the community during this period. Consolidated Mining and Smelting Limited began developing more permanent facilities with housing and basic amenities. The town of Yellowknife also expanded and some forty buildings were added during this period. Population growth forced the development and provision of many basic services. Unfortunately, the impact on the native population is not known nor documented. The only thing which could be said is that a more urban life style and alcohol was being introduced into the community.

The Industrial Operation and Community Improvement Stage began in February of 1938 and, as predicted by the model a winter supply road was completed from Peace River to Hay River. During this period the community increased from 40 to 100 buildings and a variety of commercial enterprises and agencies were added to the community. This period also saw the completion of a water and sewer distribution system.

Interrupted by the Second World War, community development continued in the post war period with the construction of a new town site and addition of services and facilities on par with southern communities. The construction of a landing strip, access roads to the landing strip and completion of an all-weather road to Hay River improved access to the community.

Stage V, *Community and Industrial Operation* is characteristic of well-developed amenities, few social problems among whites but boredom among wives. Natives are on welfare and there is marked stratification. In a study of Kitimat during Stage V, McCann (1978) found a marked segregation among social classes evident by a concentration of managerial and professional personnel near the town center and a concentration of low income immigrants at the edge of town.

This social segregation is not surprising when various facts are considered. Firstly, the single-enterprise parent company usually acquires ownership of the vast majority of the town property and the management is often offered housing at reduced costs as an incentive to move to the community. The expectations of this group are most likely much higher in terms of housing quality, and the uniformity of housing stock inhibits the expression of social status through high quality housing. Managers therefore express their status by clustering together. In these remote areas managers likely had first choice of property and therefore

tend to segregate themselves into a certain geographic area leaving the remainder of the community to sort itself out. This segregation most likely occurs during Stage III.

The specific stage during which the Native populations are attracted to the community is not known. However, in Yellowknife during Stage V, the Native population was the second largest ethnic group. In 1951, 12.7 per cent of the population was of Native Indian origin and in 1961 9.8 per cent of the population was of Native ethnicity. The native populations are drawn to these communities perhaps as early as the *Construction Stage* and seem to move into the urban setting and remain there. The community then becomes highly stratified along ethnic, occupational and income lines.

The boredom among wives, often referred to as "bush fever", was dispelled by a 1976 study conducted by Nichols and Ledger. Examining prescribed drug use the authors found little evidence to support mental health problems among northern women. In fact the usage of psychoactive drugs in northern communities was lower than in the southern control communities. (Nickels and Ledger, 1976, 53). Larson in a review of literature on personal adjustment in Fort McMurray states that very little research has been conducted to support the theory of depression or mental illness among women in these communities. Boredom is difficult to measure and is a personal, subjective concept, the study of which is beyond the confines of this thesis.

One of the problems of Stage V single-enterprise communities is the lack of employment opportunities for women. In Yellowknife in 1961 females comprised only 20.2 per cent of the labour force. During Stage VI, there were increased employment opportunities for women, 33.8 per cent of the 1971 labour force was comprised of women. Only 32.8 per cent of the Canadian labour force was female. This increase of over ten percentage points between 1961 and 1971 indicates a marked change in female labour force opportunities. The female labour force participation may be a response to the "boredom" among wives which Riffel noted.

This stage also shows a decline in the foreign born population, declining from 22.1 per cent in 1961 to 15.9 per cent in 1971. Although diversification provides jobs for the females a number of other trends appear during Stage VI. The government, in an attempt to attract and keep qualified labour, provided subsidized housing for its employees. Under this scheme, the government rented the housing to its employees, resulting in a shift from 46.5 per cent private ownership in 1966 to 28.4 per cent private ownership in 1971. Housing ownership was prevalent for only one housing type in 1971, mobile homes. Sixty-eight per cent of the population in mobile homes were owners. The other housing types were dominated by renters. In this five-year period, 1966-1971, apartments and mobile homes showed the highest growth rates while single-detached housing increased the slowest.

Stage VII, *Community Maturity* is achieved through a sense of community and belongingness. This feeling can only be reached when the community has a base population who remain in the community. Yellowknife has not yet attained this stage of development.

C. WHITEHORSE: SOCIAL CHARACTERISTICS OF DEVELOPMENT

Socially the changes in Whitehorse over the last 85 years have been similar to those described in Yellowknife, a process of changing from a rural, nomadic society to an urban cosmopolitan society. Whitehorse's existence was dependent upon transportation and acting as a transshipment point for the Klondike. It is therefore difficult to characterize Whitehorse by isolation and poor accessibility, as its very existence was contingent upon good access.

During the *Natural of Pre-discovery Stage* the Whitehorse area was inhabited from time to time by nomadic native populations. The Taglish tribe, surviving by hunting, trapping and fishing, was characterized by an informal leadership structure, with little role differentiation and an extended family kinship pattern. Erecting temporary housing around the Whitehorse area for a few weeks a year their contact with white society was limited to the traders who established a network of fur-trading posts in the Yukon in the 1800's.

The *Prospecting to Survey Stage* was an era of relative isolation. Because the airplane had not yet been invented

access was over the Chilikoot Pass by foot. Natives were hired to haul freight and baggage over the Pass. In this early stage of development Whitehorse was a mish-mash of tents and shacks, constructed of any material that was available. Although no residential pattern was evident, a block of commercial buildings catering to the transient miners emerged as the core of the community. The community was on the east side of the river and was the terminus of the tramway around Miles Canyon.

During the *Industrial and Town Construction Stage*, Whitehorse remained isolated, but access to the outside was improved as a bush trail was cut to the summit of White Pass. During this time the community remained on the east bank and little change occurred in terms of more permanent or improved housing.

The *Industrial Operation and Community Improvement Stage* occurred in 1899-1900 and the community was moved across the river to the present site of Whitehorse. The railroad was completed during this period making access to Whitehorse considerably easier. Whitehorse remained a mixture of tents and shacks of substandard construction. The commercial and industrial area along Main Street was housed in clap board or log structures. The shacks and tents indicate a lack of commitment to the community and a lack of stability in the population.

Due to the perceived impermanence of Whitehorse, no pattern of residential segregation occurred until Stage V.

The business and professional groups began imposing a pattern of residential segregation by occupying an area west and southwest of the commercial zone. The lower class residents were located near the rail line and much like the prairie town the lower socio-economic status groups were primarily on "the other side of the tracks". As with the pre-industrial city, the upper class resided in the center of the community close to their businesses. (Thomlinson, 1969, 163). This stage continued until 1938 when a new stage of *Prospecting to Survey* occurred.

The 1938-1942 period of *Prospecting to Survey* saw little change in the community; access was via the railway from Skagway, the pattern of residential segregation established during Stage V remained until 1942 when the construction of the Alaska highway began. The construction of the highway, a military operation, caused rapid expansion of the physical structure of the community. The space requirements of the military far outstripped the land available on the river flats. To resolve this problem a military reserve was established on the escarpment where a modern airport was built. Housing remained substandard because of the lack of building and zoning standards. The construction stage lasted less than a year and community improvement saw the improvement and widening of the Alaska highway. The large military population brought private investment, an improvement of available services and modern air facilities.

Between 1944 and 1953 Whitehorse entered a new *Industrial and Community Operation Stage*. Services and amenities were well-developed as new hotels, stores and an electric power plant were added to the community because of the military presence. The military segregation outside the municipal boundaries of Whitehorse created two communities; the original area of Whitehorse became known as Lower Whitehorse and the area above the escarpment became known as Upper Whitehorse. The housing in Upper Whitehorse was new and complete with modern water and sewer facilities. The housing was semi-attached and located on large landscaped lots. This stage of Whitehorse development was the beginning of a suburbanization process. More and more population began to move to suburban subdivisions outside the municipal boundaries of Whitehorse.

Community Diversification started in 1953 when the government of the Yukon Territory was moved to Whitehorse. Female employment in 1961 was increased to 30.9 per cent of the labour force and by 1971 had reached 35.4 per cent of the labour force. The foreign born population declined to 12.6 per cent in 1971 but increased between 1951 and 1961. This may be due to post war immigration from European countries rather than due to any development variation. The major increases in various ethnic groups between 1951 and 1961 were in German, Ukrainian and Asian ethnic origins. The influx of more immigrants will tend to create more segregation as these groups tend to cluster together.

Much like Yellowknife, Whitehorse had experienced a decline in housing ownership in Stage VI. The percentage of housing which was single-detached declined to 54.5 per cent in 1971 and ownership declined to 48.3 per cent. Rental accomodation was primarily apartment and single-attached while owned accomodation was single-detached and mobile homes. Tenure also varied by length of residency. Whitehorse residents who occupied their dwelling more than three years tended to own their housing while those occupying their accomodation less than two years tended to rent the housing they occupied. In Yellowknife this trend was not evident until after six years of occupancy. This may be a better indicator of commitment to the community.

Stage VII, which has not yet occurred, will provide more opportunities for the female labour force, a more stable population, less transience, and the population will show signs of aging. Population in the late life cycle stages will increase, bringing demand for social services for the aged and tending to lead to economic problems in the community.

D. SOCIAL GEOGRAPHY OF SINGLE-ENTERPRISE COMMUNITIES

This section of the thesis addresses the geographic distribution of various social phenomena during the development of single-enterprise communities. Following McCann's methodology residential segregation during the *Industrial Operation and Community Improvement, Industrial*

and Community Operation and Community Diversification Stages is examined. Information describing the social segregation is derived from both the maps and tables in the Appendix.

INDUSTRIAL OPERATION AND COMMUNITY IMPROVEMENT

Fort McMurray during Stage IV, *Industrial Operation and Community Improvement*, displays a highly structured spatial pattern of social segregation. A distinct pattern emerges when high status occupations are considered. The managerial, professional and technical occupations were grouped together and represent occupations associated with high status. In Fort McMurray the highest concentration of these occupations occurs in a central enumeration area, enumeration area 164, on a slight rise close to the downtown. Figure 10 provides an enumeration area map reference for Fort McMurray. Of the total reported occupations, managerial, professional or technical occupations comprised 29.5 per cent of the enumeration area population.

The enumeration areas with the lowest percentage of managerial and related occupations were on the outskirts of Fort McMurray. (Figure 10 and 11) The second highest concentration of managerial occupations occurs in enumeration area 167, directly adjoining enumeration area 164, this enumeration area is predominantly an apartment area. It is possible that these professionals are employed in the construction industry which provides housing for its employees while they are in the field. Enumeration area 168,

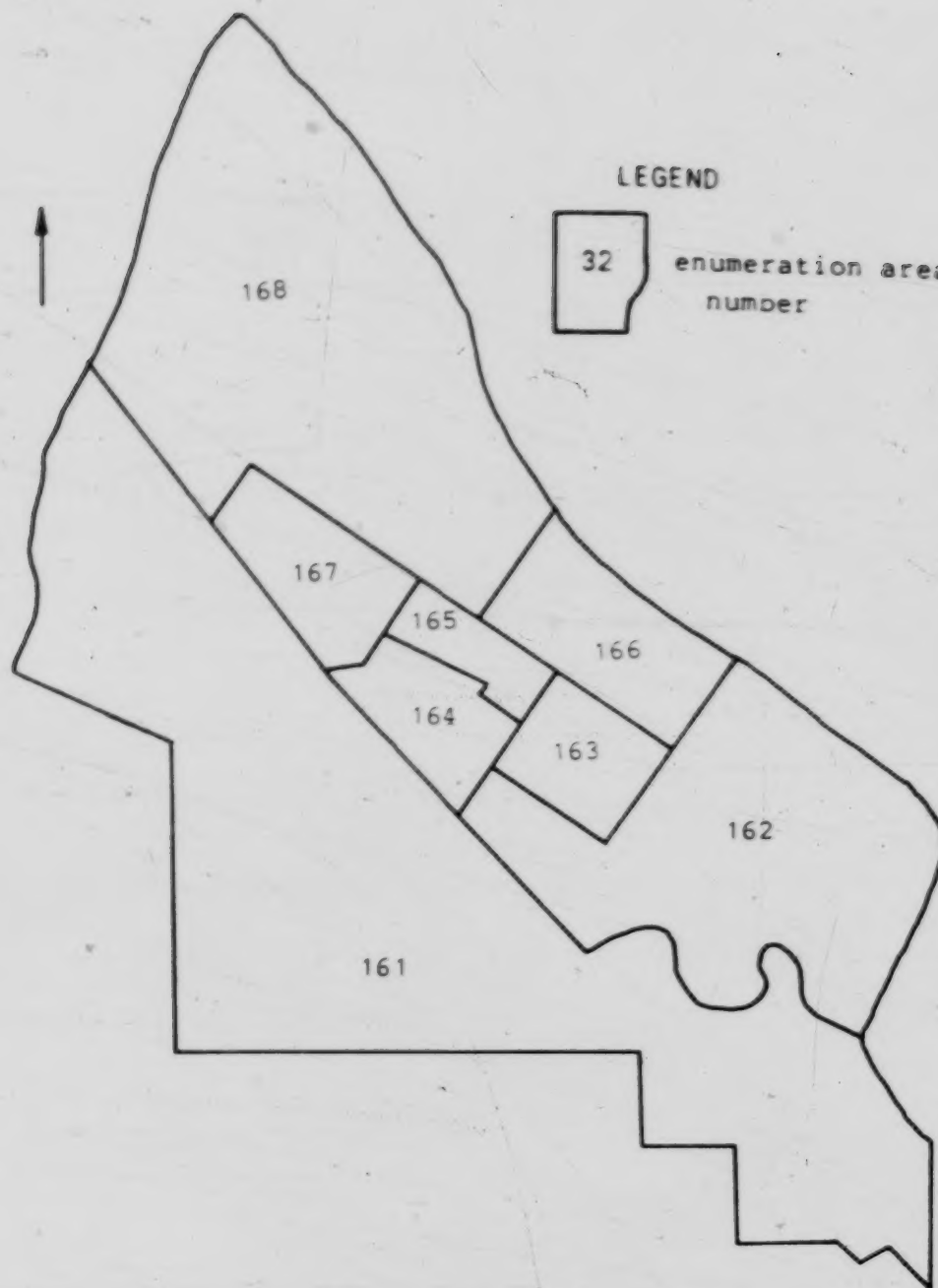


Figure 10
Enumeration Areas,
Fort McMurray: 1971

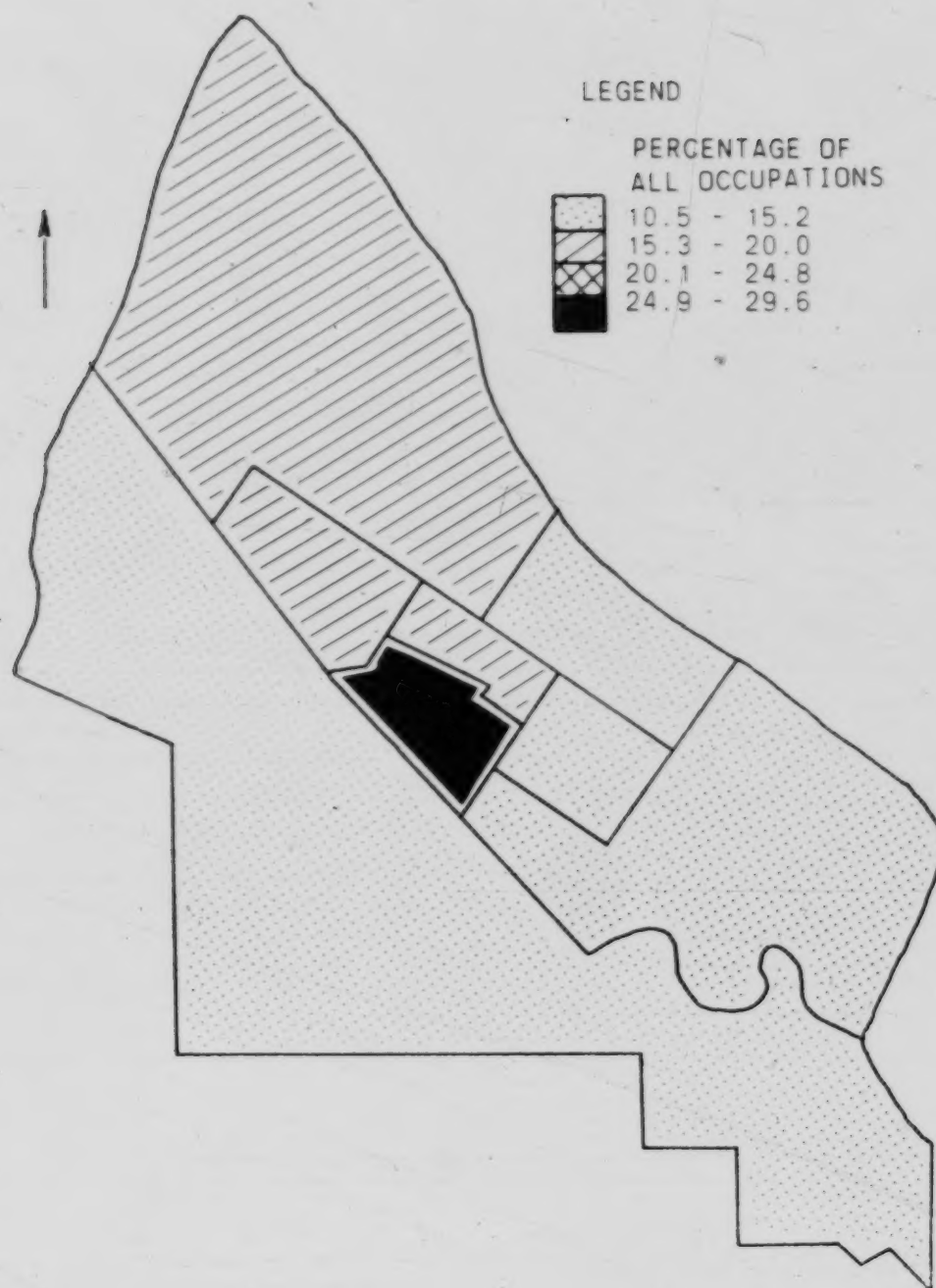


Figure 11
Distribution of Managerial, Professional
and Technical Occupations: Fort McMurray, 1971

also an enumeration area which is on the outskirts of the town, had the third highest proportion of management occupations. The relatively large size of enumeration area 168 and the fact that it stretches from the commercial area to the town boundaries suggest that there may be a mix of high and low status occupations in the enumeration area.

The Processing and Related Occupations should show a reversal of the pattern established for managerial, professional and technical occupations. Although the pattern which emerges is generally the opposite of the managerial occupation pattern there appear to be a number of anomalies. These anomalies may be more the result of the size and shape of enumeration areas than indicators of a differential pattern. Enumeration area 164 a central area, which ranked highest on the managerial scale also ranked lowest on the processing occupations with only 14.8 per cent processing occupations. (Figures 10 and 12) Enumeration area 163 ranked highest in proportion of occupations in processing and related occupations. The peripheral enumeration areas had the second and third highest proportion of processing occupations, with 27.1 per cent and 26.9 per cent respectively. Two of these three enumeration areas are located to the north and west of the commercial area while one is south of the commercial area.

Population in Sales, Service and Clerical occupations are distributed in a sectoral pattern with the highest concentration in enumeration area 161 at the outskirts of

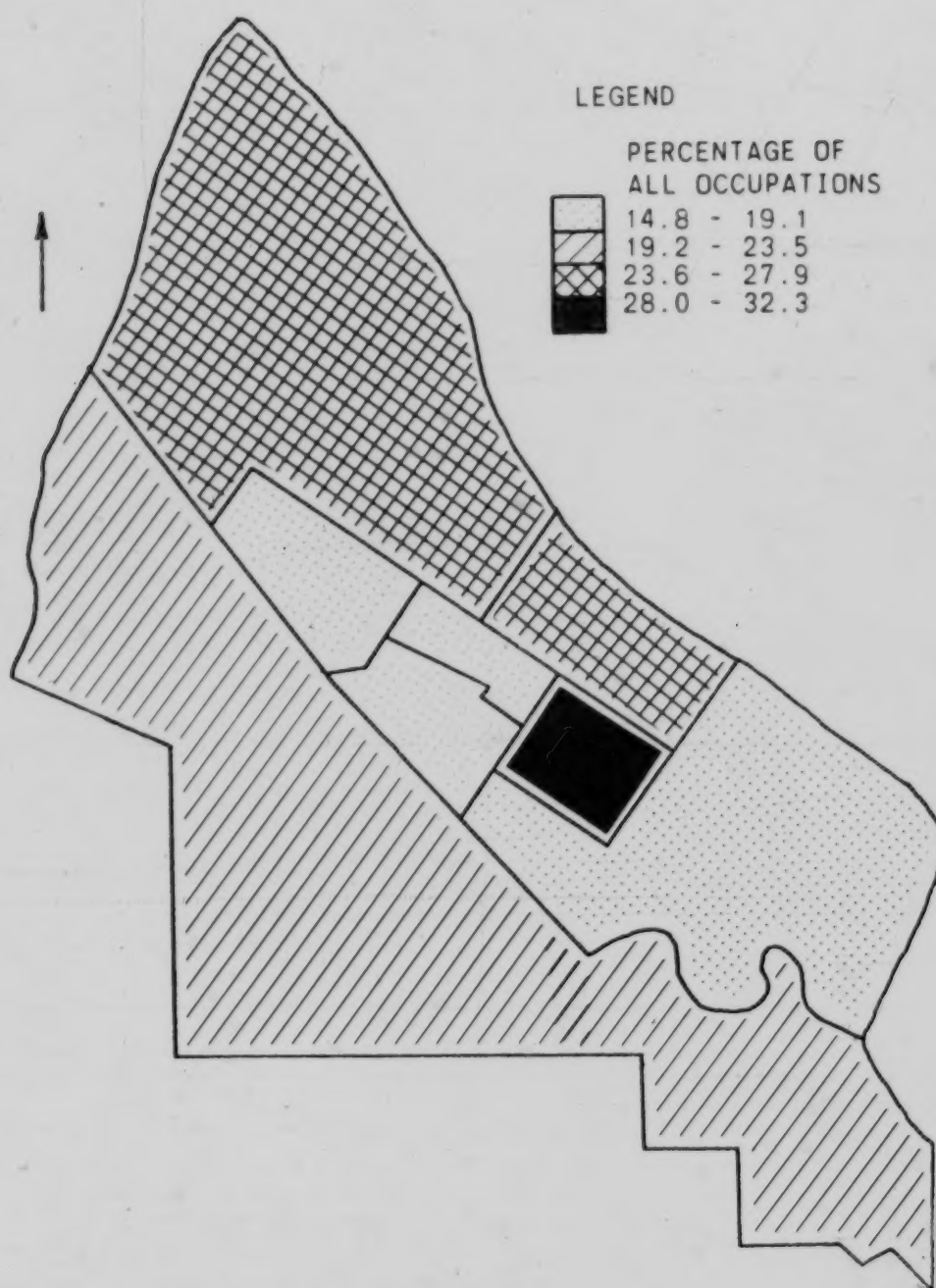


Figure 12

Distribution of Processing and Related
Occupations: Fort McMurray, 1971

the town, 42.1 per cent. The second highest concentration of Sales, Service and Clerical occupations occurs in enumeration area 165 the most central of all enumeration areas, 39.0 per cent of the occupations reported in enumeration area 165 were related to Sales, Service or Clerical occupations. (Figures 10 and 13) The two enumeration areas located between 161 and 165 have the third and fourth highest concentration of Sales, Service and Clerical occupations with 37.5 per cent and 35.1 per cent respectively.

Occupations in Transportation and Communication showed the highest concentrations in the peripheral enumeration areas. Enumeration area 162, 5.4 per cent, enumeration area 161, 5.3 per cent and enumeration area 168, 5.2 per cent are all at the outside edges of the community. (Figures 10 and 14) The three enumeration areas with the most central location in the community ranked lowest in occupations in Transportation and Communication industries. This group of occupations is composed of labourers, and semi-skilled craftsmen working in these industries. The pattern, therefore, reflects the social organization of the pre-industrial city with lower status population to the periphery of the city.

The average income for each enumeration area was computed using only population over 15 years of age in the denominator and total employment income in the numerator. The average income in Fort McMurray is distributed in a

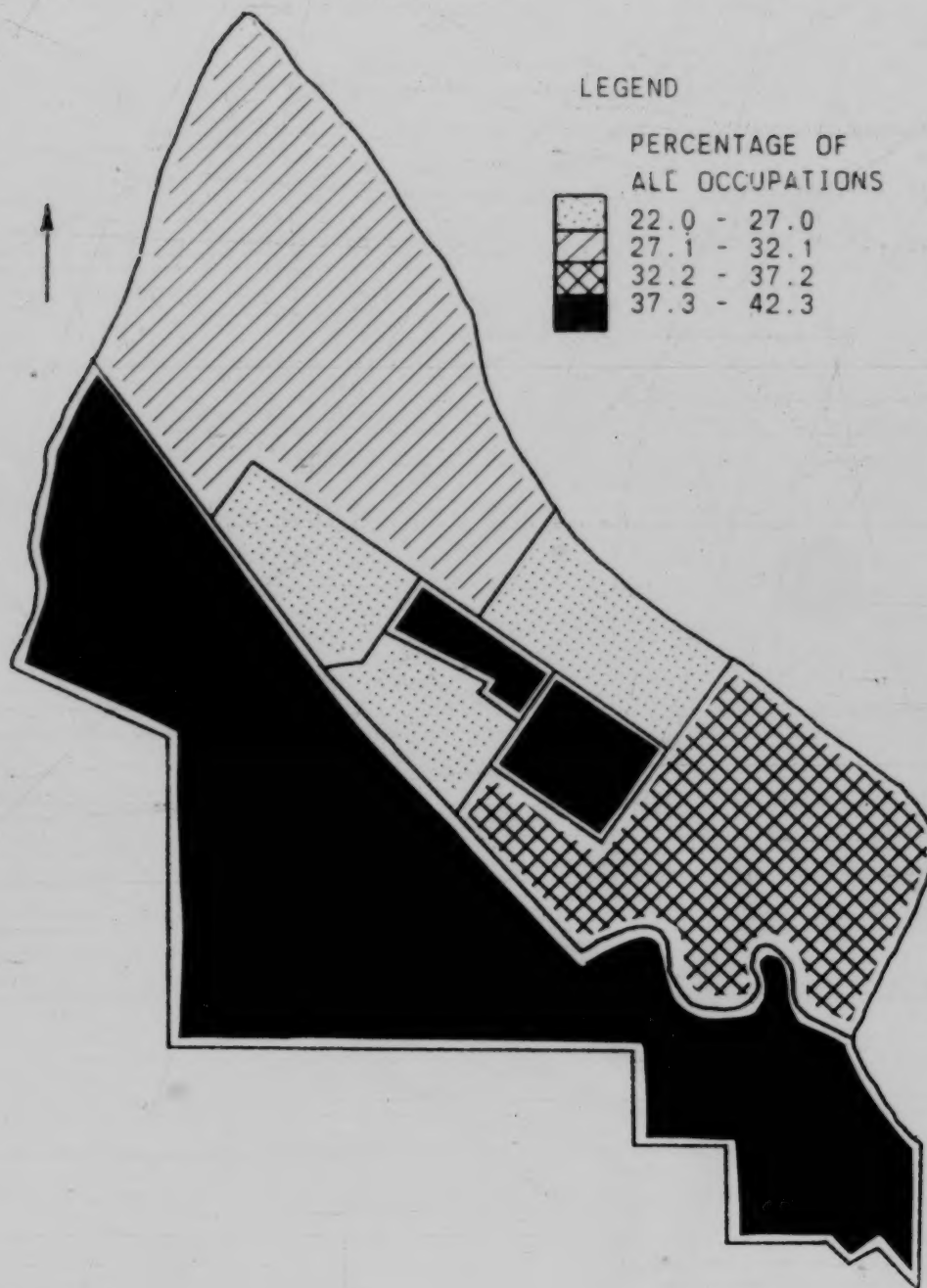


Figure 13

Distribution of Sales, Services and Clerical
Occupations: Fort McMurray, 1971



Figure 14

Distribution of Transportation and Communication
Occupations: Fort McMurray, 1971

similar pattern to managerial occupations. The highest average income occurred in a central enumeration area which also had the highest concentration of managerial occupations. (Figure 15) The lowest average income corresponded to the area with the lowest proportion of managerial occupations. Enumeration area 161 had a 1971 average income of \$2821 and enumeration area 164 had an average income of \$5977. The two areas with the highest average incomes are centrally located. Enumeration area 162 had the third highest average income and this may be the result of the area between King and Hospital Streets being an area similar to enumeration area 164. This portion of the enumeration area is comprised mainly of single family homes and adjoins the enumeration area with the highest proportion of managerial occupations.

Another indicator of social status is tenure. The majority of high social status populations prefer and can afford to own their own homes. With this in mind the relative proportions of owners and renters in each enumeration area was calculated. The highest proportion of owners occurs in enumeration area 164, where 80 per cent of the housing is owner occupied. Enumeration area 162 had 76.5 per cent owner occupied housing creating a pattern similar to the spatial pattern of income. (Figures 10 and 16) Enumeration area 163, although it had the second highest average income, had the second highest proportion of renters. This enumeration area ranked highest on processing

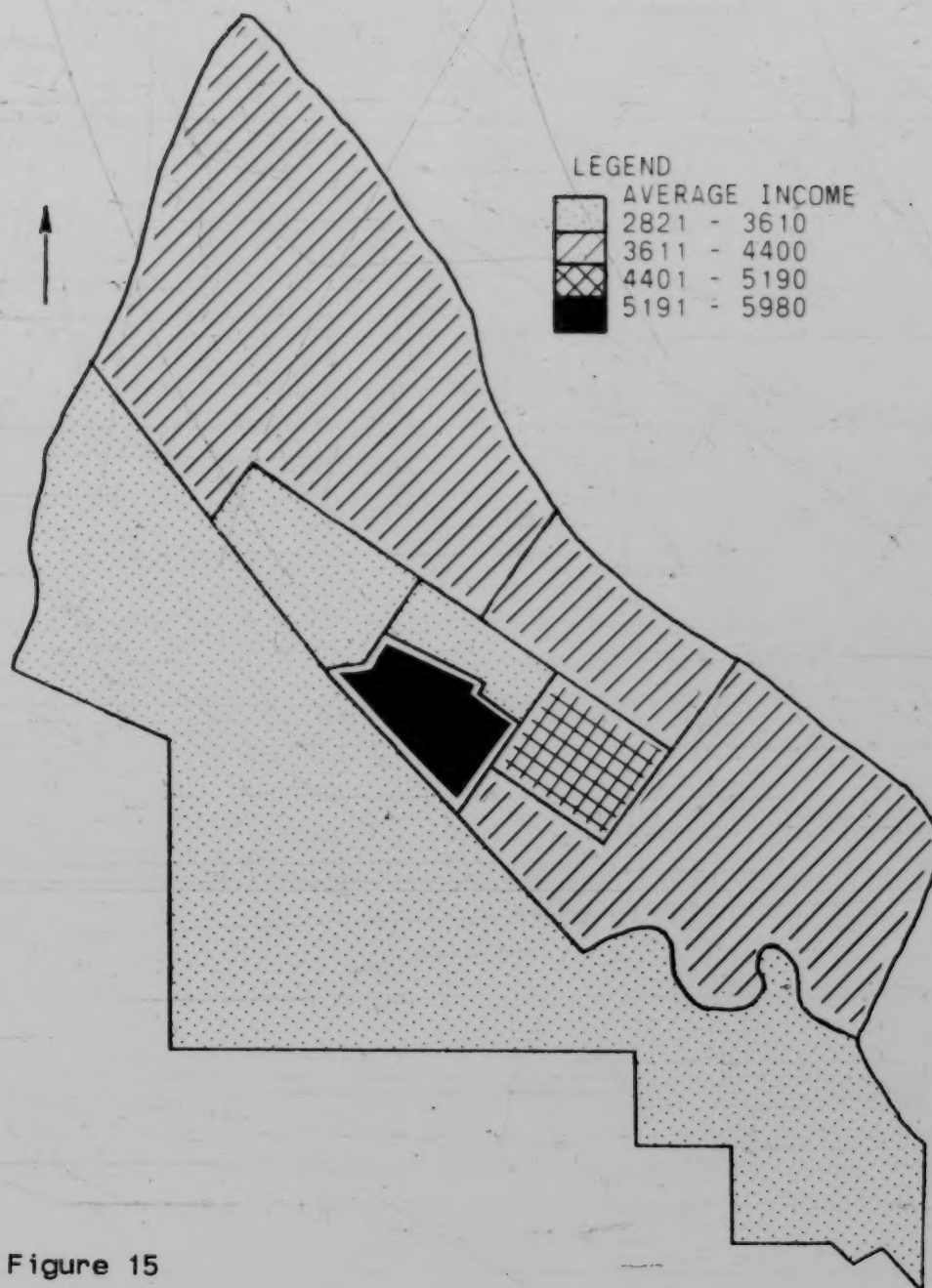


Figure 15
Distribution of Income:
Fort McMurray, 1971

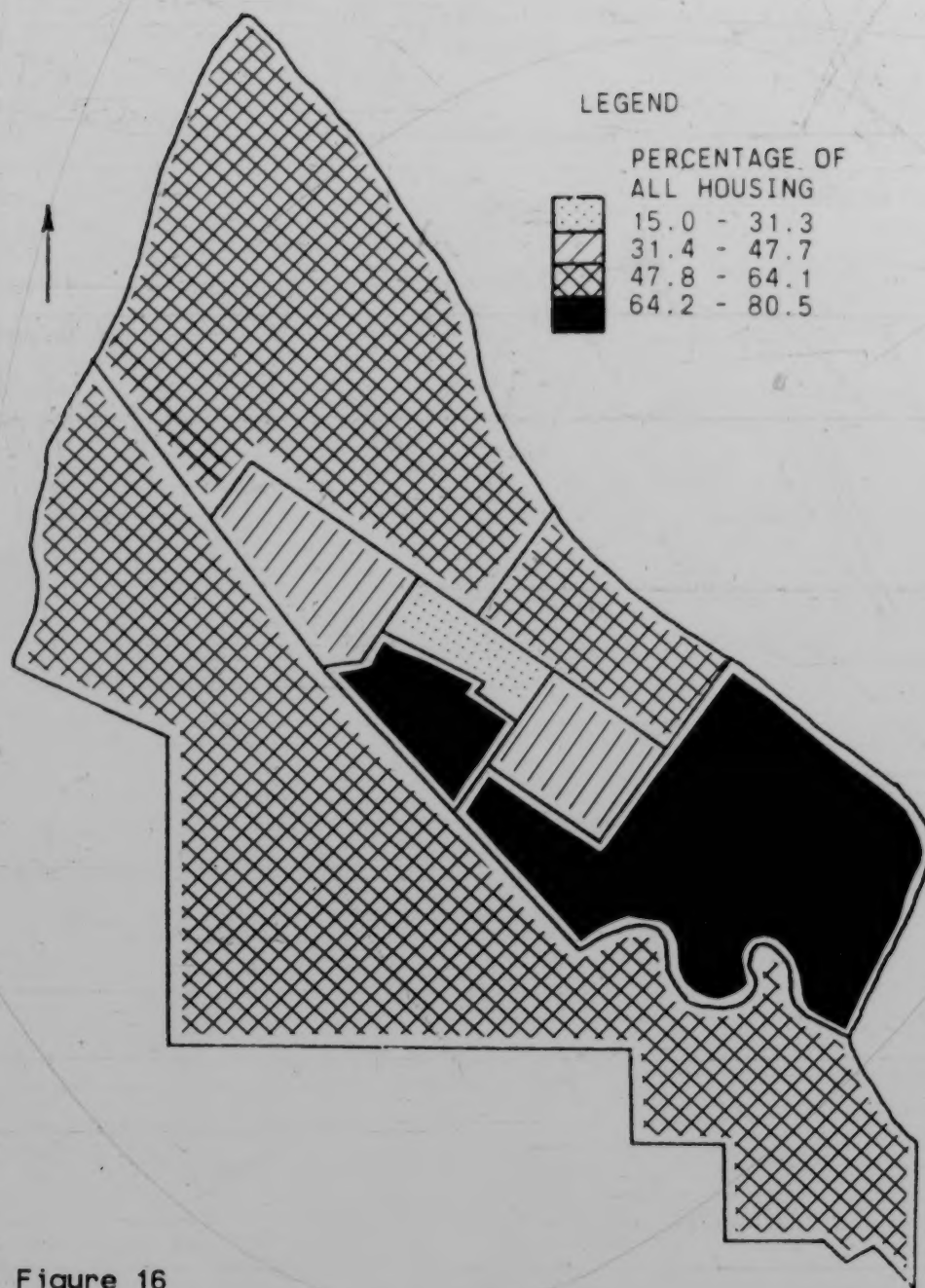


Figure 16

Distribution of Owner-Occupied
Housing: Fort McMurray, 1971

occupations and the low proportion of owners may be due to a housing subsidy program sponsored by Suncor. A high density area of duplexes and low rise apartments adjacent to the commercial strip on Franklin Avenue had the highest proportion of renters.

Housing type is another indicator of relative social status with the single-detached house being the most prestigious of the housing types and mobile homes being the least prestigious. In Fort McMurray, central enumeration areas had the highest proportions of single-detached housing. In enumeration area 164 all of the housing was single-detached and 80 per cent of this housing was owner occupied. Using mobile homes as an indicator of lower social status, the four enumeration areas which are at the periphery of Fort McMurray had the highest proportions of mobile homes, indicating lower socio-economic status groups. The three central enumeration areas had no mobile homes.

The level of educational attainment of population not attending is predictably higher in high status areas than the lower status areas. The population which had completed a university degree was concentrated in the central enumeration areas, enumeration area 164 again having the highest proportion of population achieving this higher standard of education. The population having completed some elementary training will be considered as representative of lower status populations. The pattern which occurs is the direct opposite of the pattern of university graduates. Here

the concentration of low levels of completed schooling are concentrated in the outlying areas and the central areas are low in population having completed only elementary schooling. No differentiation in terms of education occurs because education in Canada is compulsory to age 15 and the probability of having completed some secondary schooling is high.

Due to the tendency of native populations to be drawn to the single-enterprise community, squatter settlements often appear near the edge of single-enterprise communities. (Siemens, 1973, 6) In order to determine if natives are in the community the distribution of population of native indian origin was examined. The enumeration areas with the highest proportion of native population were all adjoining the boundaries of the community.

The two major religions in Fort McMurray were Roman Catholic and United. The religious segregation appears to be very similar to the pattern of native population and may be reflective of social status. The outside enumeration areas were highest in proportion of population of the Roman Catholic faith, while the central enumeration areas had higher concentrations of United Church supporters.

During Stage IV there appears to be a significant segregation along occupational, income, education, housing, religious and ethnic lines. The high social status groups occupy the central areas around the retail and community facilities, while lower status groups appear to occupy more

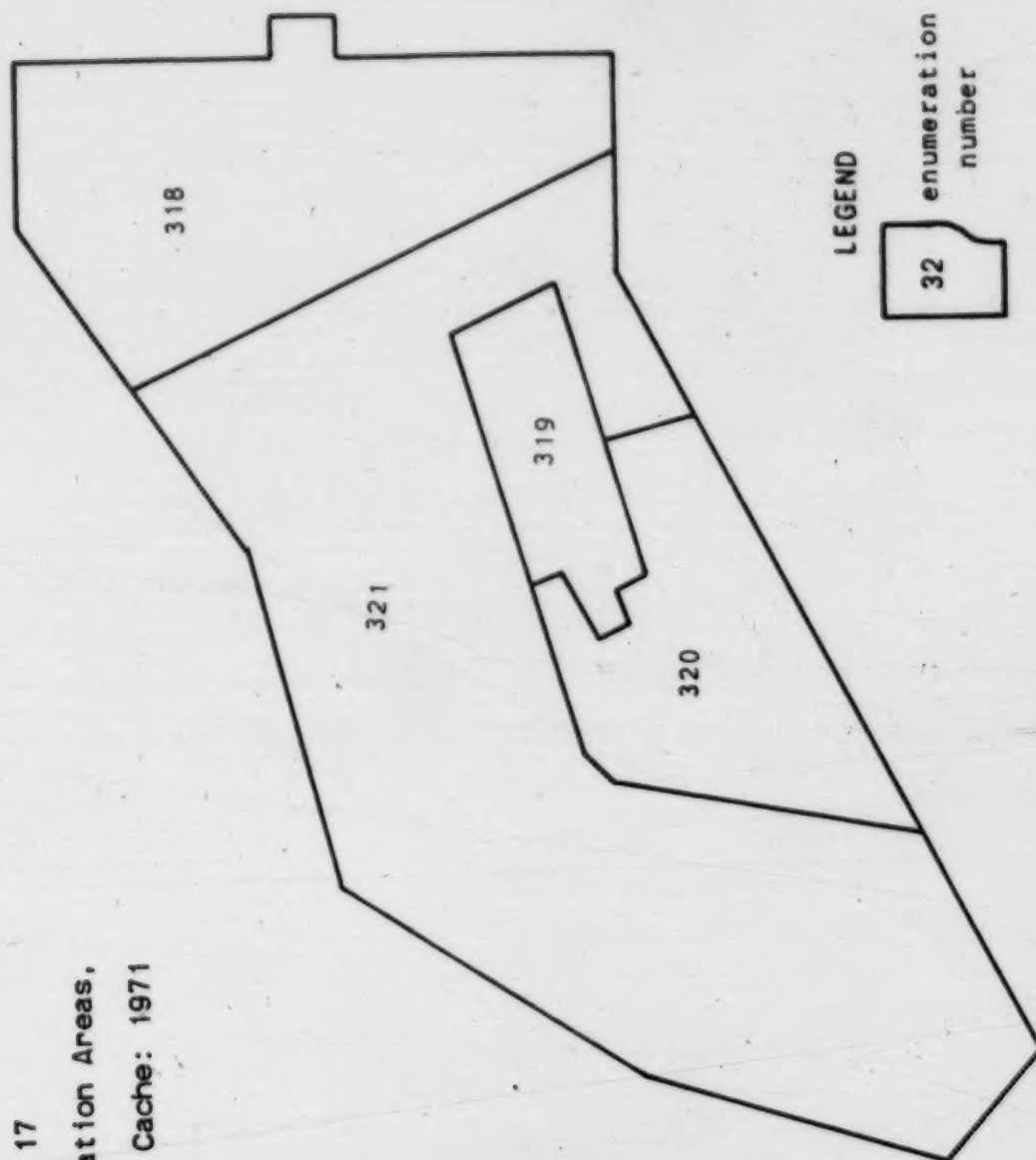
peripheral areas which are not as accessible to the retail shopping area or other community facilities. Much like the pre-industrial city the prestigious areas are in the central areas close to the amenities.

INDUSTRIAL AND COMMUNITY OPERATION

Stage V, the operational stage for both industry and community will be exemplified by the community of Grande Cache. Grande Cache is being used to portray Stage V because no Census data were available for the Study communities during Stage V. Grande Cache is a small coal mining community north of Hinton, Alberta. The community has a very small population base of 2,500. The relatively small size of the population resulted in only four enumeration areas being used during the 1971 Census. (Figure 17) The ecological arrangement of Grande Cache is slightly different than Fort McMurray. The highest concentration of managerial professions occurring in enumeration areas 321 and 318 while income was distributed such that enumeration area 319 and enumeration area 321 had the highest average family income. (Figures 18 and 21) The highest concentration of primary occupations (mining in this case) was enumeration area 319 and enumeration area 320. Enumeration area 320 was also the only enumeration area with very reduced proportions of processing occupations. (Figure 19)

Sales, Service and Clerical occupations were concentrated at the periphery with 29.4 per cent of

Figure 17
Enumeration Areas,
Grande Cache: 1971



LEGEND

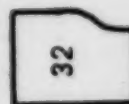


Figure 18
Distribution of Managerial, Professional,
and Technical Occupations: Grande Cache, 1971

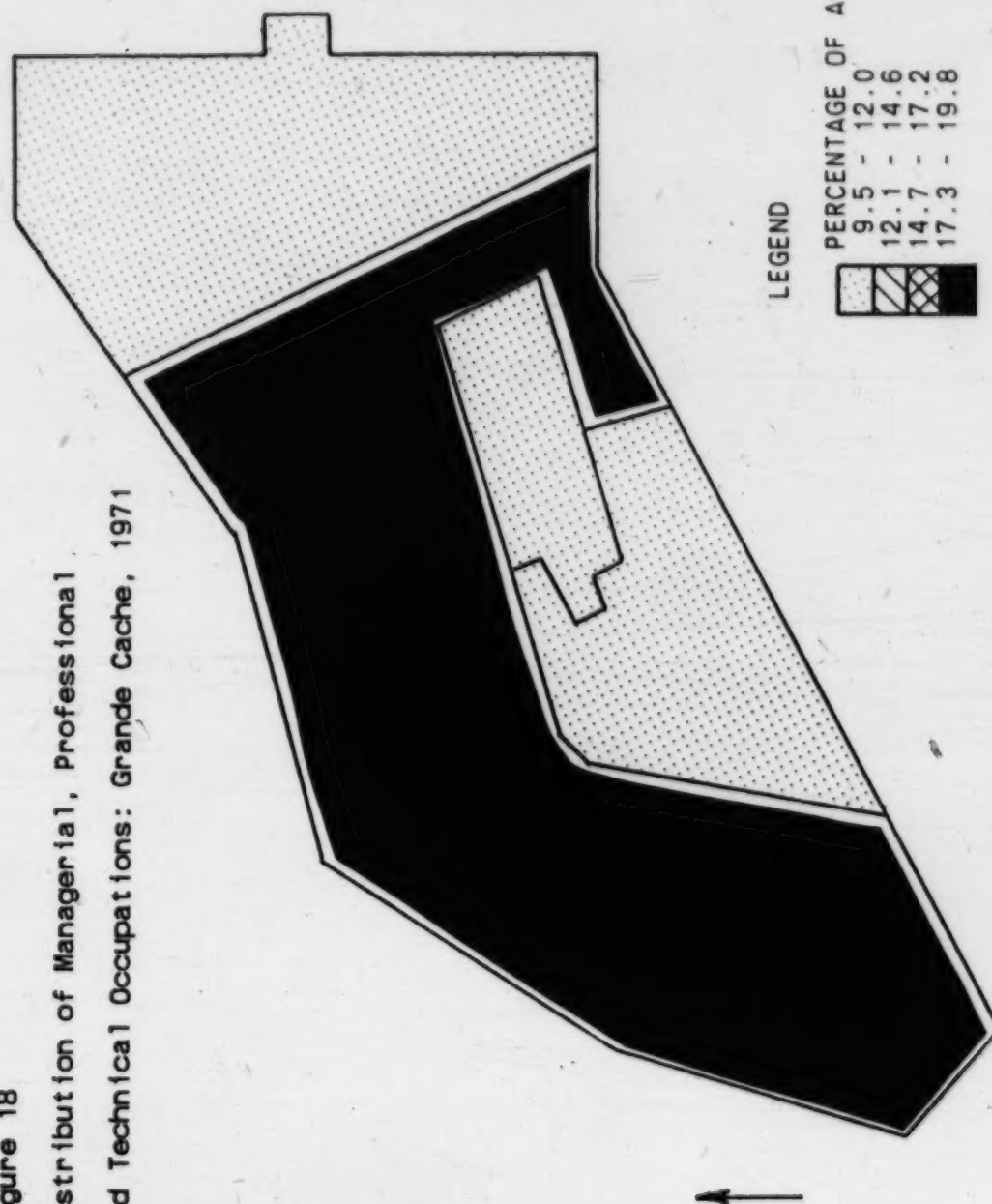


Figure 19

Distribution of Processing and Related

Occupations: Grande Cache, 1971

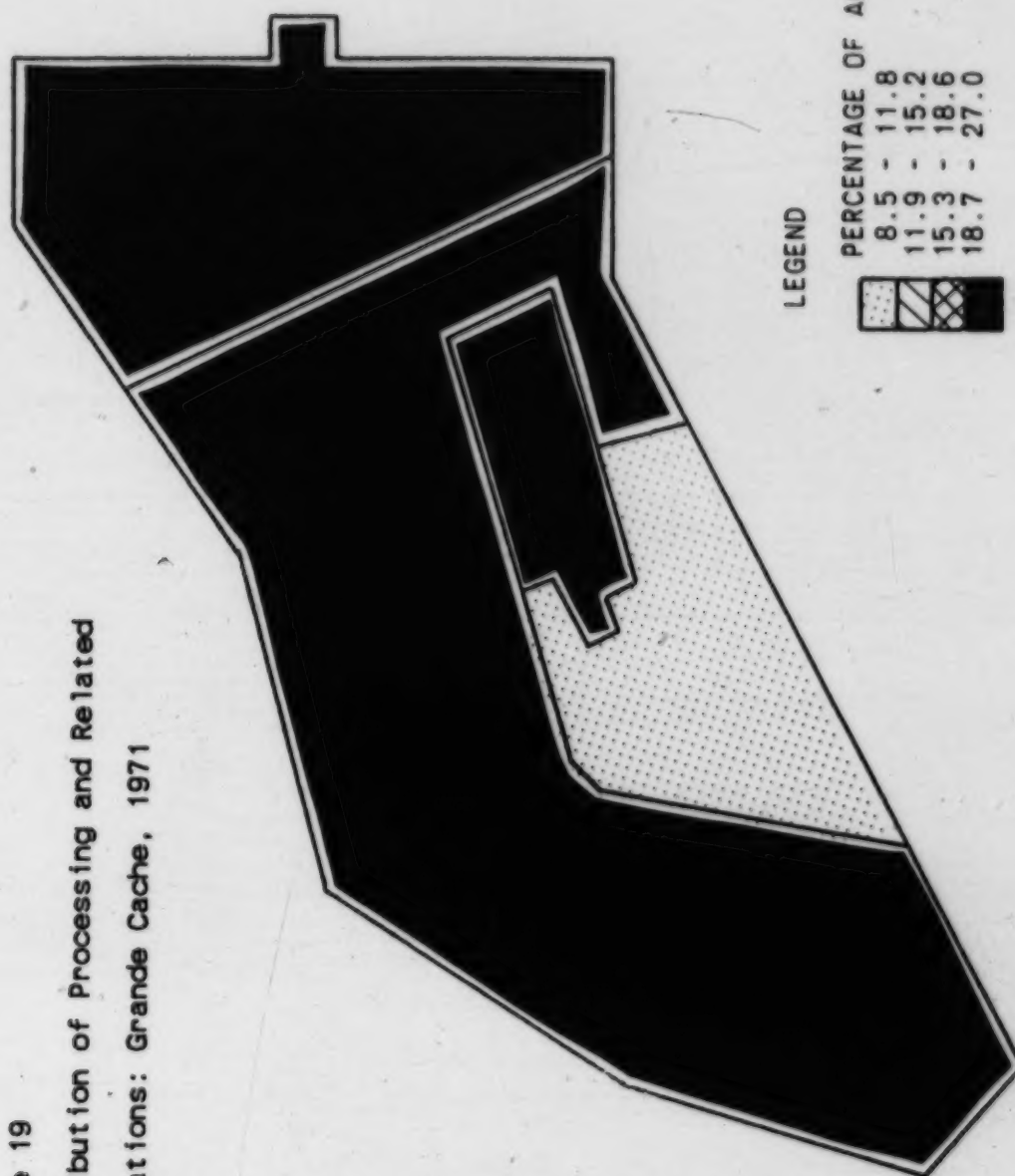
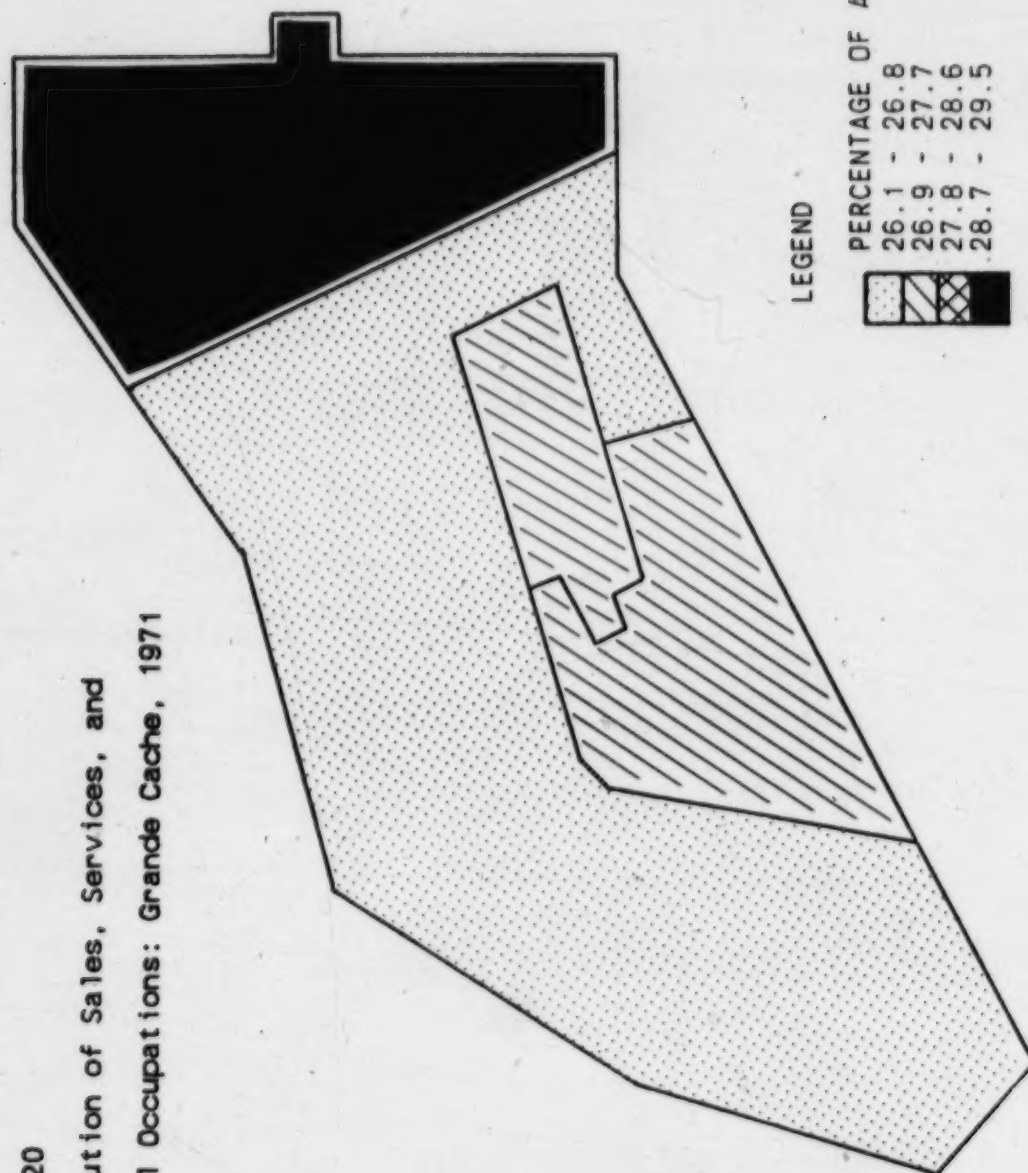


Figure 20
Distribution of Sales, Services, and
Clerical Occupations: Grande Cache, 1971



enumeration area 318 employed in Clerical Occupations. (Figure 20) Enumeration areas 319 and 320 had the highest concentration of both owned homes and single-detached homes. (Figure 22) Virtually all of the housing in enumeration area 318 consisted of mobile homes; 92.6 per cent were mobiles and 7.4 per cent were single detached. The only apartments in the community were located in enumeration area 321.

The educational attainment of the population in Grande Cache was distributed in a similar pattern to income. Enumeration areas 321 and 319 had the lowest concentration of population with only elementary schooling and enumeration area 321 also had the highest concentration of population with a university degree.

Segregation along ethnicity and religious affiliation show a similar social pattern. Enumeration areas 319 and 321 have the lowest concentration of native population and enumeration area 321 has no native population. Enumeration area 318 also ranked highest on French ethnic origin. Religious affiliation shows a pattern similar to the pattern already noted, with the highest concentration of United Church supporters corresponding to the two enumeration areas with the highest social status, enumeration area 319 and 321. Enumeration areas 318 and 320 show the highest concentration of Roman Catholics.

The social segregation seems to be very high in the community with a tendency for higher status groups to gravitate to enumeration area 319 and 321. Enumeration area

Figure 21
Distribution of Income:
Grande Cache, 1971

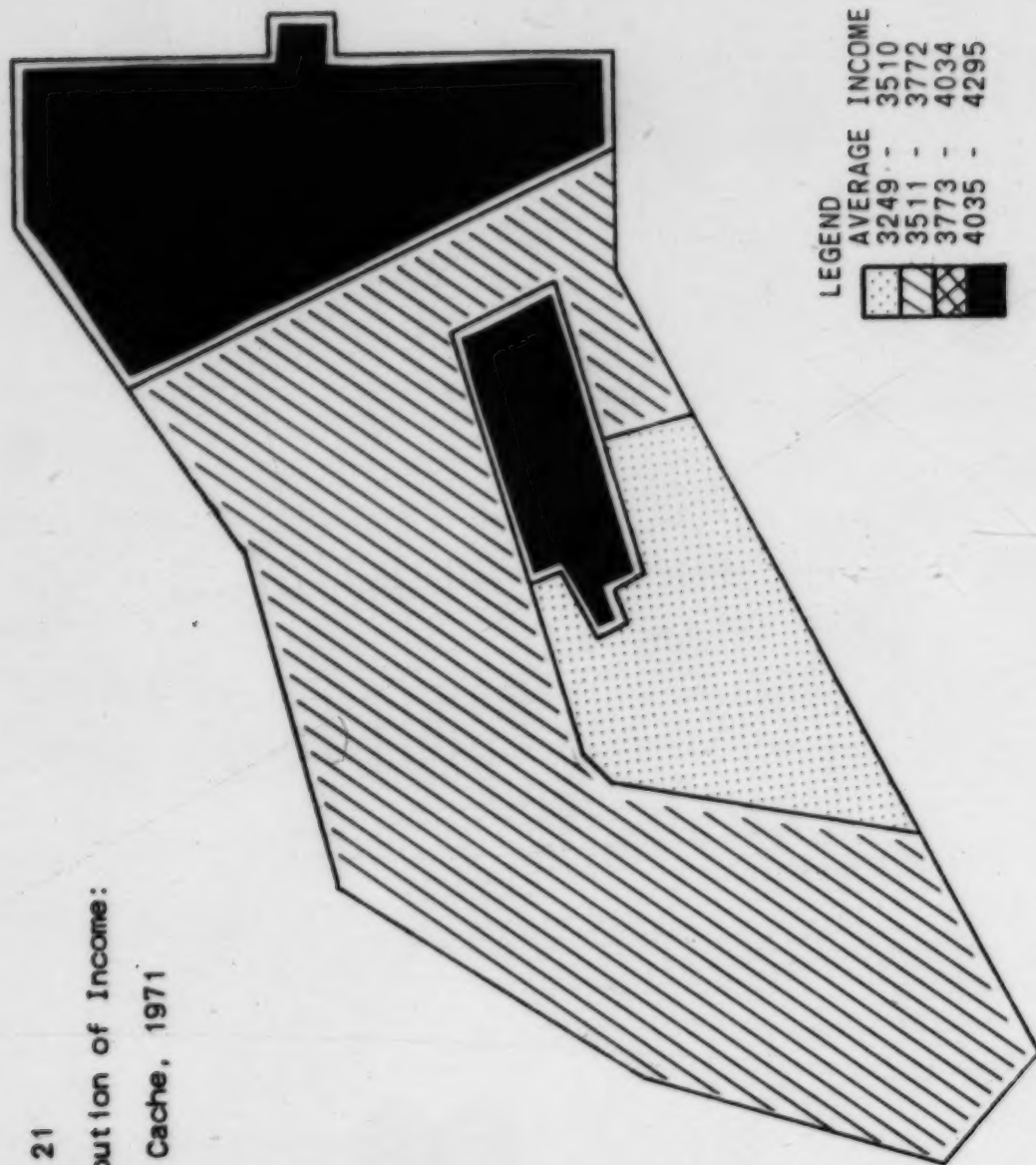
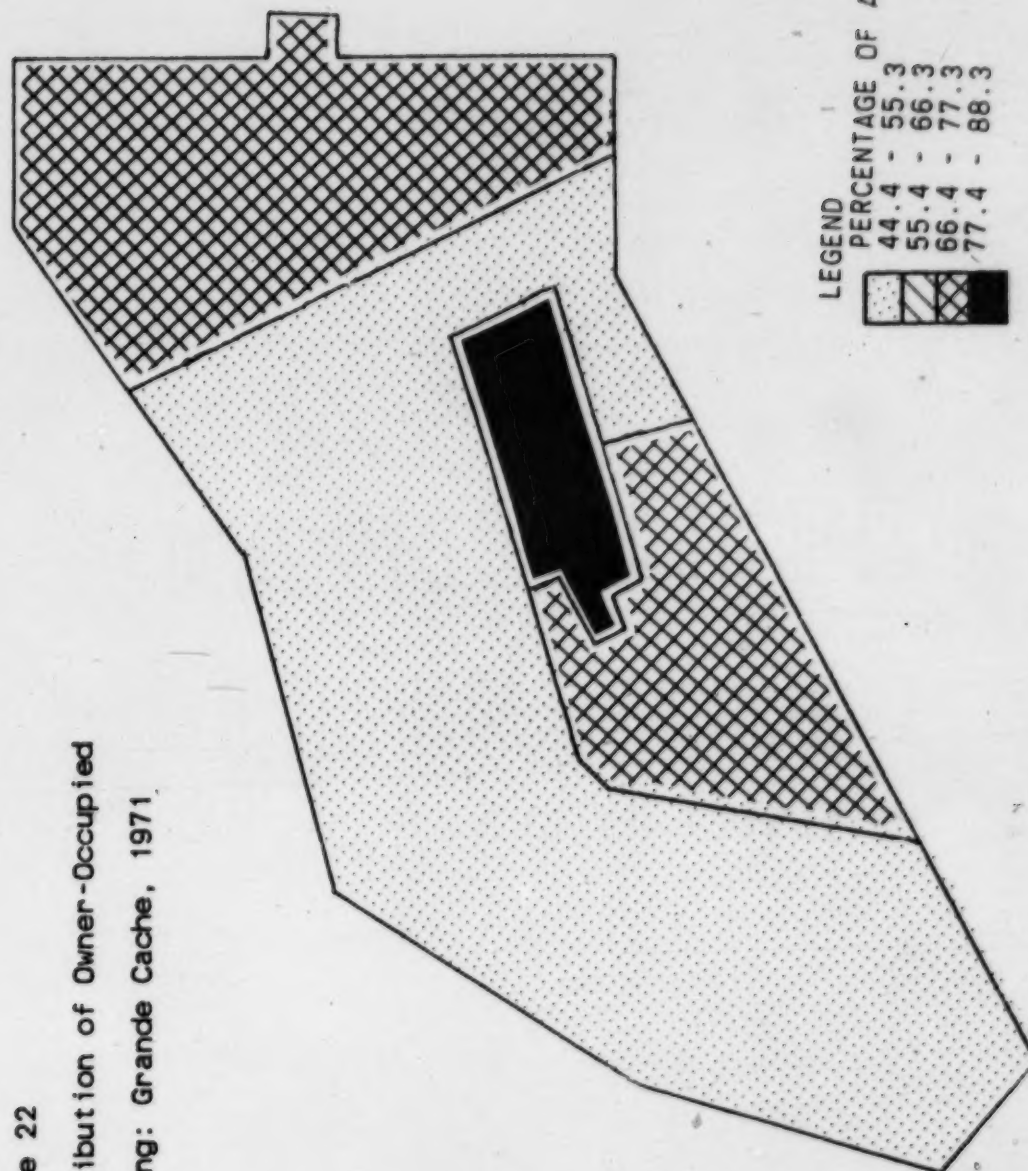


Figure 22
Distribution of Owner-Occupied
Housing: Grande Cache, 1971.



321 consistently had the highest proportion of population with high status variables and the lowest proportion of population with low status variables. The enumeration area map shows a configuration which tends to obscure any definite pattern from emerging. This may be the result of the small size of the population. Both of the high status enumeration areas encompass the central area of Grande Cache and the enumeration area with the consistent low status was at the periphery.

COMMUNITY DIVERSIFICATION

The ecological arrangement seems to change when the community enters Stage VI. The upper class having dominated the central area of the city, now disburse to the outlying areas as a new period of growth and residential development occurs. Due to the relatively small size of the community prior to diversification, very little land is available for new migrants. The need for housing the new migrants generates suburban growth at the edge of town. The expansion of services also increases land values in the central area, causing the upper class to sell and move to the new suburbs.

Yellowknife in Stage VI experienced rapid population growth. The requirements for more residential space to serve the expanding territorial government employees and the expansion toward Consolidated Mining property imposed a new social pattern on the community. In 1971 the segregation of professional occupations resulted in three enumeration areas

with very high proportions of managerial, professional or technical occupations. An enumeration area map, Figure 23, provides a reference to enumeration area numbers.

Enumeration area 20, the most westerly of the enumeration areas reported the highest proportion of professionals in both numeric and percentage terms, 32.1 per cent or 125 people reported occupations that were professional in nature. (Figure 24) Enumeration area 62, which is at the end of the commercial area of Yellowknife, and also in the western part of the city had the second highest percentage of professional occupations, 29.8 per cent. Enumeration area 69, also had a high proportion of occupations that were of a managerial, professional or technical nature.

The enumeration areas with the lowest proportion of high status occupations were enumeration area 66, 64, 65, 68. All of these enumeration areas contain large tracts of commercial and industrial land. Enumeration areas 65 and 60 are lease holdings of Giant Mines, and Consolidated Mines respectively, and enumeration area 64 is a dock area where shipping is unloaded from Great Slave Lake shipping. These areas of industrial and commercial use are segregated to the east while the professional occupations are concentrated in the west, removed as far as possible from the industrial land use. Enumeration area 60, the Consolidated Mining property is the only industrial use in the western part of the community. These groups concentrated in the western part of the city had the highest average incomes in the

Figure 23
Enumeration Areas,
Yellowknife: 1971

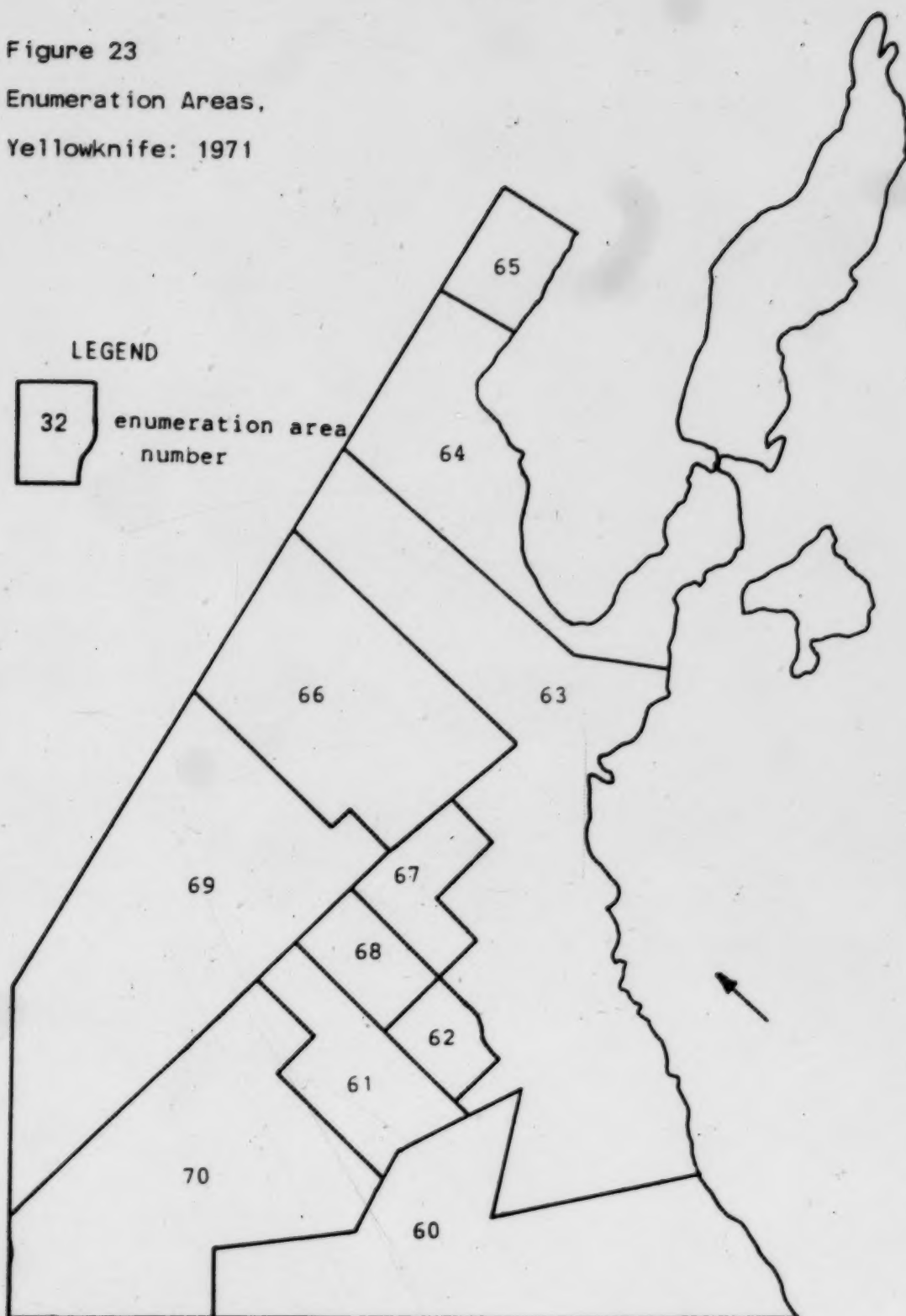
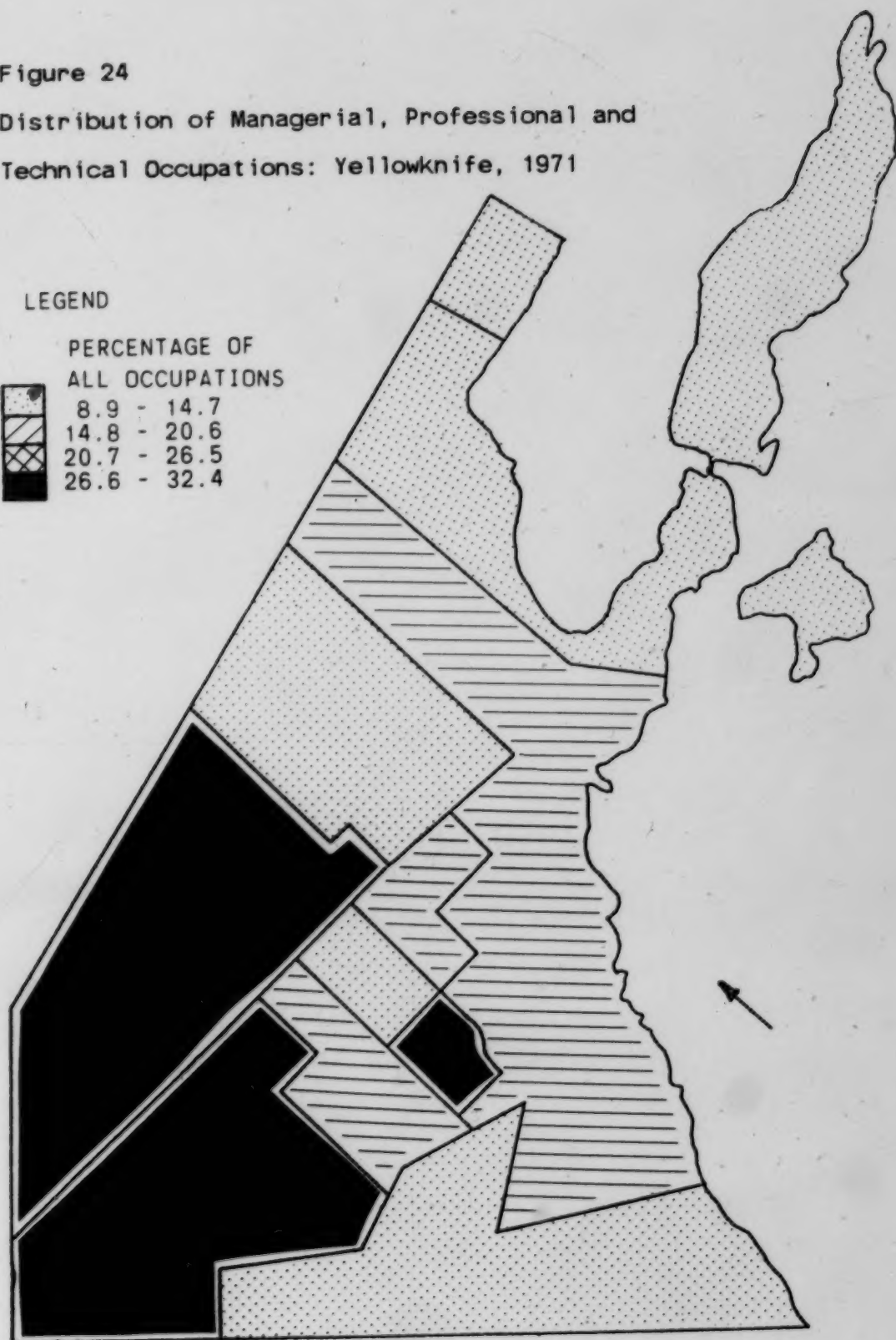
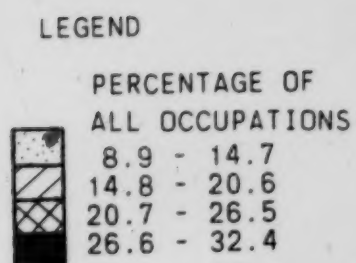


Figure 24

Distribution of Managerial, Professional and
Technical Occupations: Yellowknife, 1971



community. The population of enumeration area 62 had an average income of \$6,259 in 1971, and population in enumeration areas 70 and 69 had average incomes of \$6,135 and \$6,097 respectively. (Figure 25) The lowest reported incomes were in enumeration areas in the east, enumeration areas 64 and 66 where the heavy industrial and commercial properties were located.

The highest concentration of Mining and other Primary Occupations, was in enumeration areas 60 and 65. The two mines provide some housing for miners at the mine site. Outside these two enumeration areas the concentration of miners was in the enumeration areas to the east end of Yellowknife. Enumeration areas 66, 64, and 67 had high concentrations of mining personnel. More than ten per cent of the total population of these three enumeration areas were single.

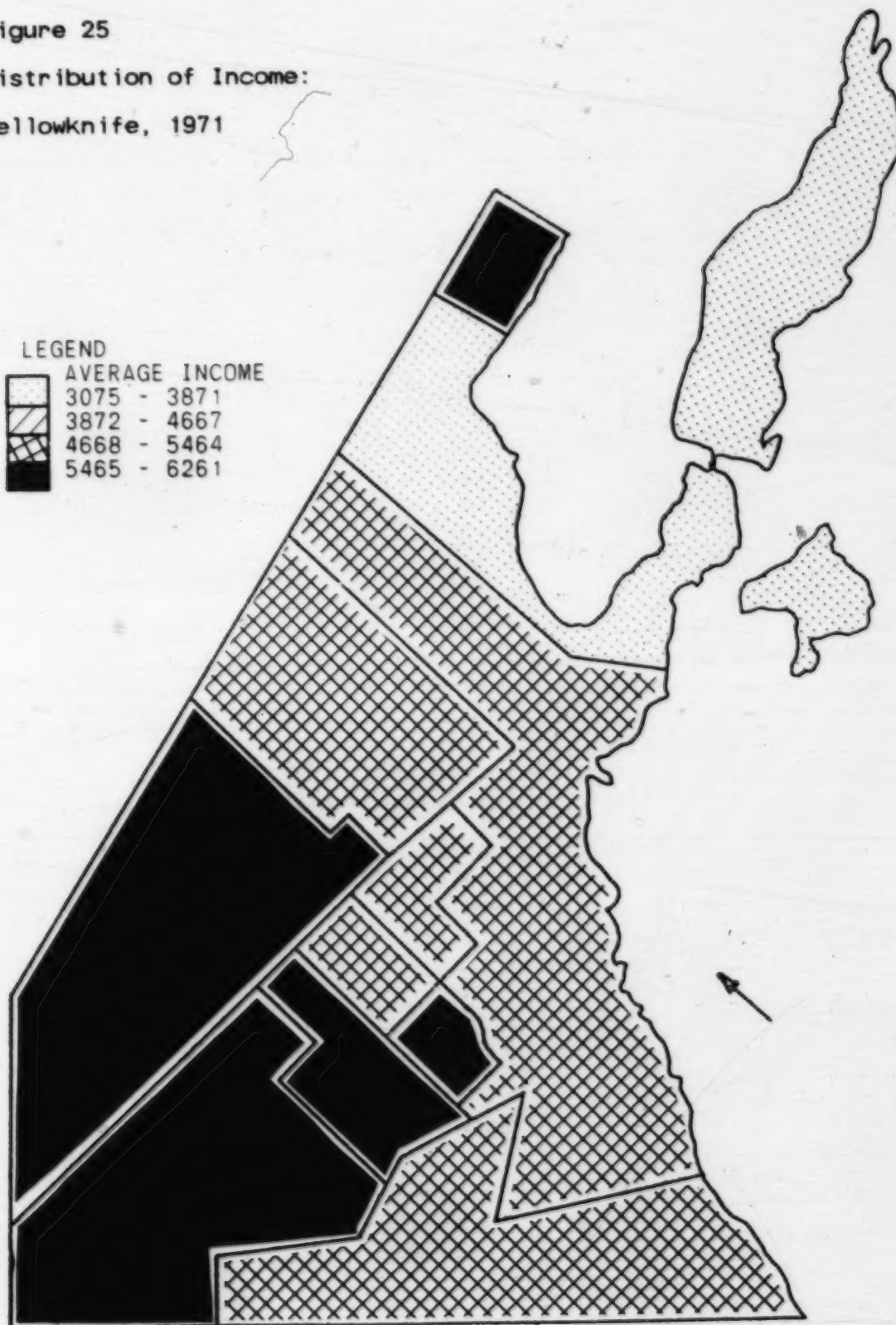
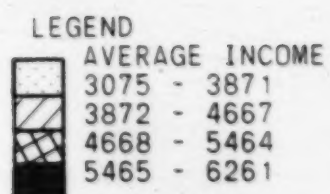
During Stage VI, *Community Diversification*, the type and tenure of housing at least in Yellowknife do not reflect social status. Three enumeration areas have no privately owned dwellings and the highest proportion of owned dwellings occurs in the enumeration area where the old town of Yellowknife was located and is now predominantly heavy industry and commercial enterprises. This reversal in tenure pattern is due to the government providing its employees with subsidized housing.

The educational attainment of the population who had completed their education in 1971 supports the high-low

Figure 25

Distribution of Income:

Yellowknife, 1971



status pattern varying from east to west. The higher the education attainment the more likely the person will be located away from the commercial and industrial area.

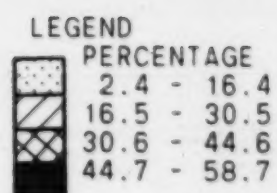
Enumeration area 62 had 17.2 per cent of its population who had completed a university degree, enumeration area 70 had 13.1 per cent and enumeration area 69 had 8.7 per cent.

By contrast, low education attainment levels, were concentrated toward the commercial and industrial eastern part of the city. Enumeration area 64 had the highest proportion of population who had elementary schooling. Enumeration areas 68 and 63, both of which adjoin the downtown were areas of high concentration for population with lower levels of educational attainment. Twenty-four per cent of the population in enumeration area 64 had reported completing no schooling in 1971.

Information as to the ethnic origin of population in various enumeration areas indicates that enumeration area 64 is predominantly Native Indian, in that 58.4 per cent reported Native Indian as their ethnic origin. (Figure 26) The native population concentrations generally decline from highest in the east to lowest in the high status suburbs in the west.

Unlike Stage IV and V the religious denomination of Roman Catholic is no longer concentrated at the edge of the city but is now located in the central areas. The highest proportion of Roman Catholic followers occurred in enumeration areas in eastern Yellowknife where the lower

Figure 26
Distribution of Population of Native
Heritage: Yellowknife, 1971



status groups are concentrated. The United Church supporters are now concentrated in the west in the newer suburbs. (Figure 27)

The Community Diversification Stage of Yellowknife is a suburbanization process, but due to physical constraints, particularly Yellowknife Bay, the process has been concentrated at the west end of the commercial main street.

Community Diversification, in Whitehorse started in 1953 when Whitehorse became the capital of the Yukon. Enumeration area data for Whitehorse in 1971 were not readily available, however, 1971 data for occupation, income, and housing were available. These three variables will therefore comprise the majority of analysis on Whitehorse during the community diversification stage.

The spatial organization of Whitehorse is such that the enumeration areas 15-21 are located in the central part of Whitehorse near the commercial center of the city. (Figure 28) Enumeration areas 7-13 and 23-29 are located in areas removed from the downtown. Enumeration areas 7-13 are south of the downtown core and enumeration areas 23-29 are north of the downtown core.

The distribution of managerial, professional or technical occupations is similar to the pattern in Yellowknife. (Figure 29) The six enumeration areas with the highest proportions of these occupations were external to the central area. In enumeration areas external to the downtown area there was a concentration of the enumeration

Figure 27
Distribution of United Church
Supporters: Yellowknife, 1971

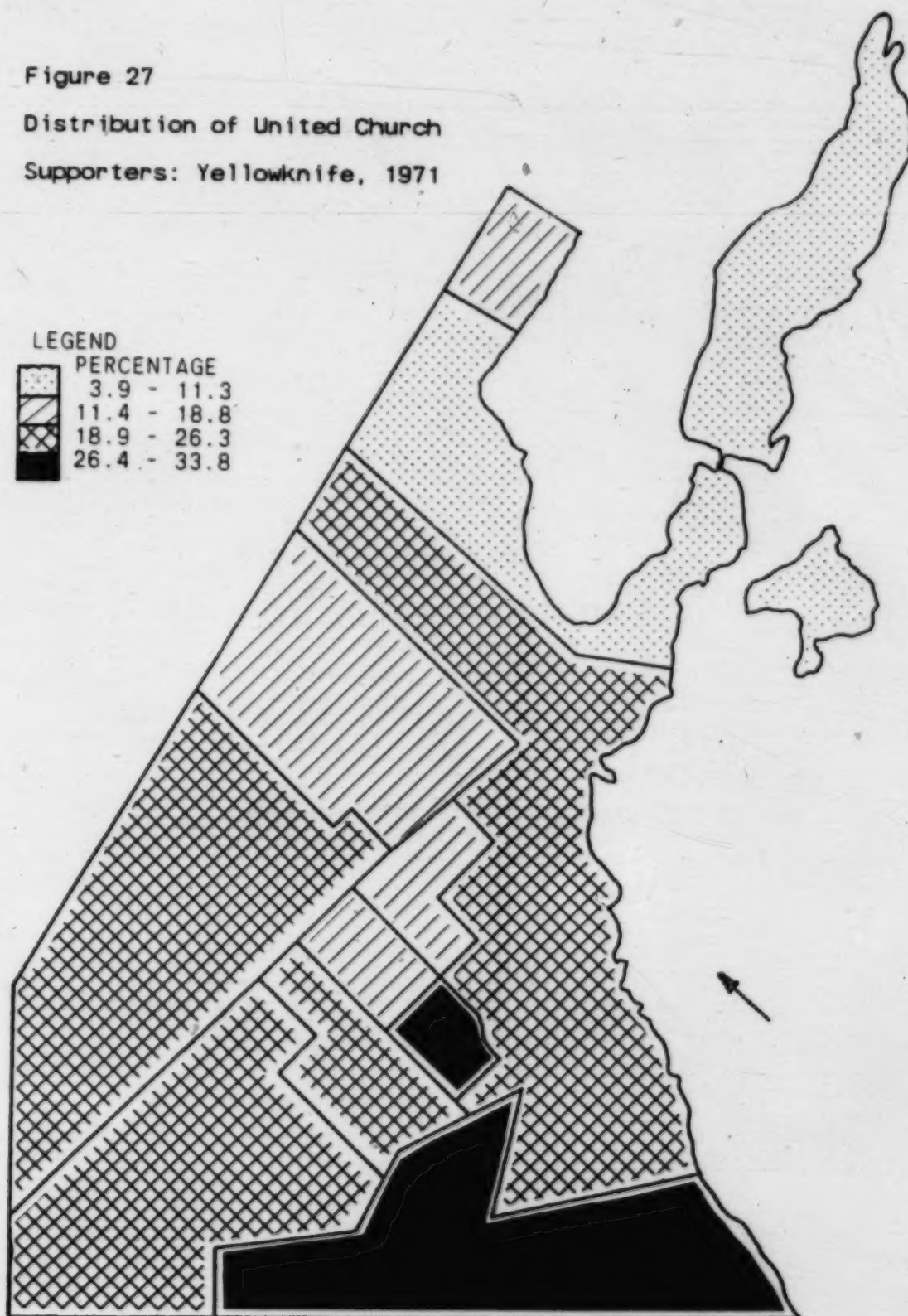
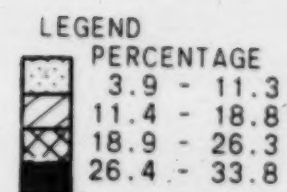


Figure 28
Enumeration Areas,
Whitehorse: 1971

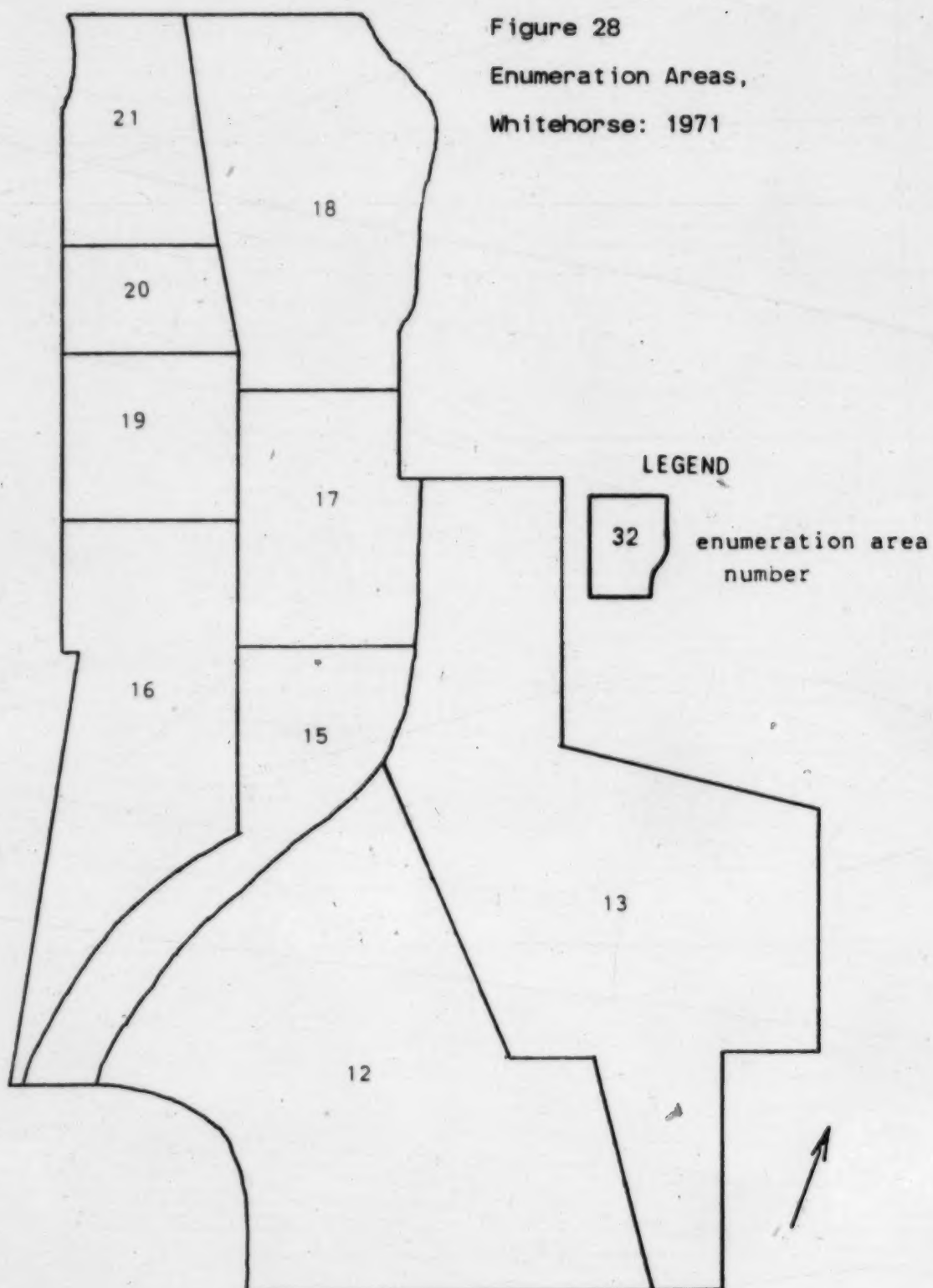


Figure 29

Distribution of Managerial,
Professional and
Technical Occupations:
Whitehorse, 1971

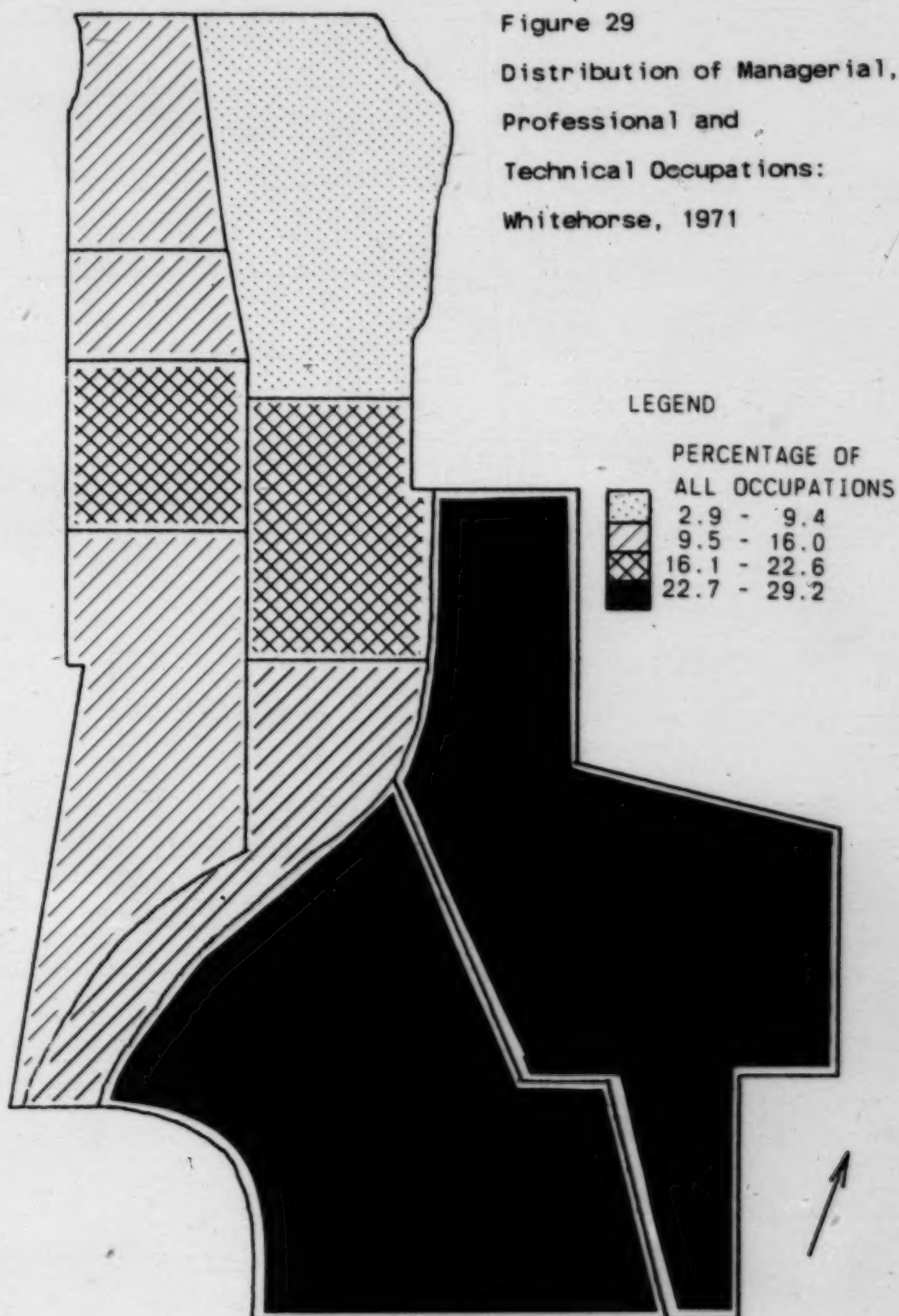
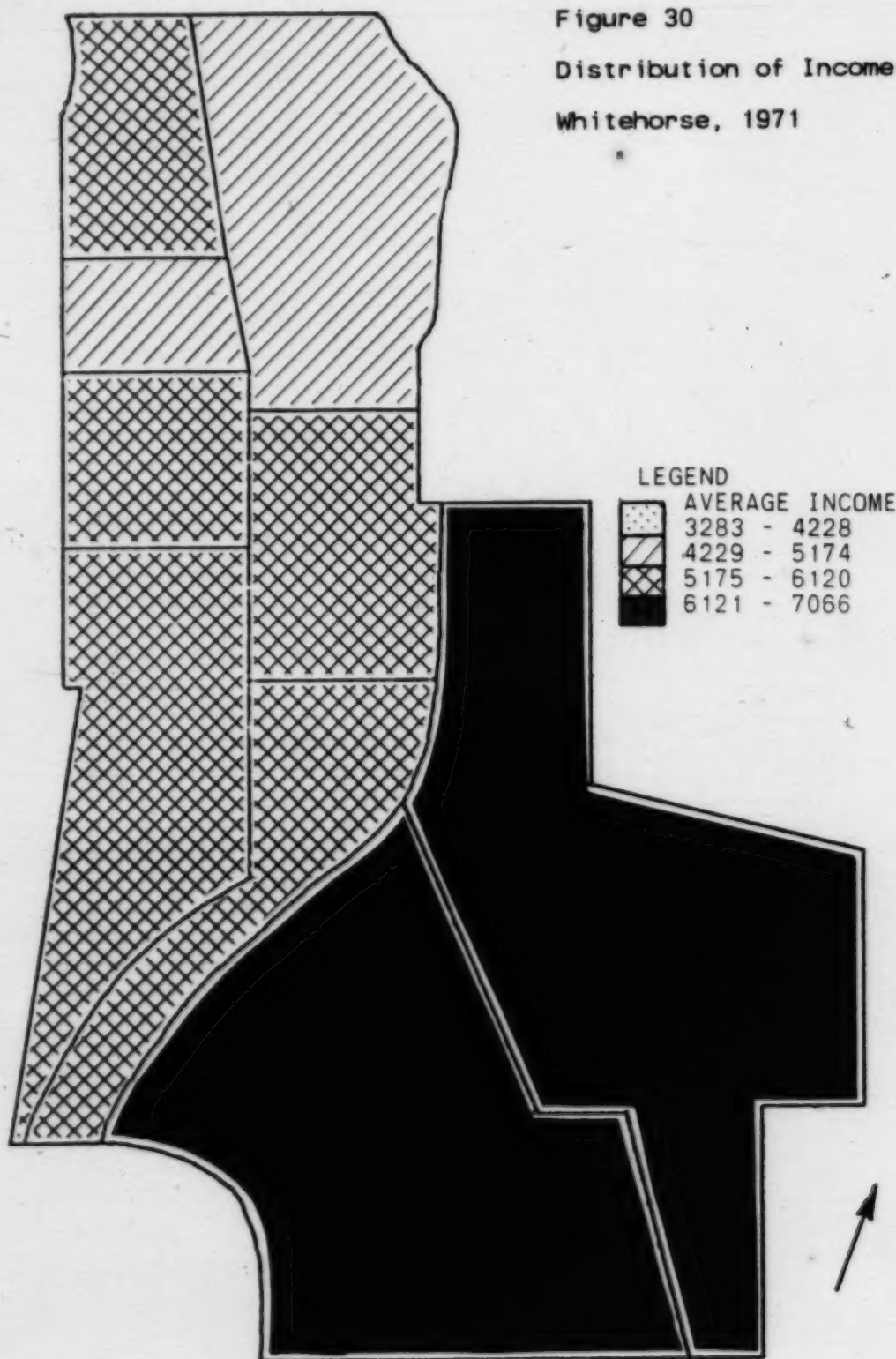


Figure 30

Distribution of Income:

Whitehorse, 1971



the central area. In enumeration areas external to the downtown area there was a concentration of the enumeration areas which exhibited high proportions of managerial occupations. There appear to be two distinct types of enumeration areas in the outlying suburban areas, those which have the highest concentration of managerial and related occupations and those which have the lowest concentration of managerial occupations.

Enumeration areas 15 and 18 are the only two central enumeration areas which had very low percentages of population in managerial and related occupations. These two enumeration areas also ranked highest in proportion of clerical, sales, and service occupations. The enumeration areas which were external to the central area, also had low concentrations of managerial, professional and technical occupations and ranked high on processing and related occupations. Transportation and communication occupations were also concentrated in the external enumeration areas, particularly the ones with relatively low concentrations of managerial and related occupations.

Average income was distributed in a similar pattern as managerial occupations. Of the five enumeration areas with the highest average incomes, four were outside the downtown core of Whitehorse. Enumeration area 19, the only high income enumeration area in the downtown, was the area originally inhabited by the community elite in the post Klondike Gold Rush era. (Figure 30) Enumeration area 12 and

reflecting the conspicuous consumption of elite groups such as the Commission and Territorial Council. (Koroscil, 1978, 34). Much like the suburbanization process in the metropolitan areas there would appear to be areas of elite upper class with middle class groups attempting to cluster near the upper class and gain some status by proximity.

E. CONCLUSION

Socially, the single-enterprise community appears to have differing patterns according to its stage of development. Much like the demographic stages of development the seven stages of social development collapse into four distinct stages. The first two stages are similar and can be collapsed into a single stage with unique social characteristics. The predominant native culture with low income persists in both Stage I and II. This stage could be characterized more appropriately as a "Gemeinschaft" type of society.

Tonnies used the terms Gemeinschaft and Gesellschaft to characterize urbanization and the resulting social changes. The native population in the pre-industrial development stage have a sense of belonging to a community or culture with personal attachment to the social setting. During Stage III, IV and V the social structure is in transition from a Gemeinschaft to a Gesellschaft type of social organization. (Cortese and Jones, 1979, 10)

The influx of southern construction workers whose cultural and social patterns are more in line with the southern urban society, creates a very different set of social expectations from the unstructured, informal role structures existing in the native populations. Although the construction workers are the first group to arrive in the new community, a limited number of senior managers will have arrived and have had the first opportunity to select housing in the new community. This group has first choice in the housing, and because of its uniform quality these groups will tend to pick the best locations in the community. These locations are normally near the central area close to retail stores, schools, and community facilities.

This pattern of high status groups occupying the central areas is similar to the social pattern of pre-industrial cities. Unlike the pre-industrial city where the elite grouped close to the central area because of the distance which had to be walked, the central clustering in resource communities is more likely due to the desire of these groups to be close to each other for socializing and secondly to keep undesirable lower status groups away from them.

There may even be a subconscious attempt to form a protective subcommunity. Once established, this pattern of segregation remains the same until there is some external force which brings on renewed growth and expansion. This pattern of central segregation of the elite groups is

dominant through stages III, IV, and V.

During Stage VI, the community experiences renewed expansion and the arriving elite are forced to take up residences beyond the location of the outer ring of lower status population. The expansion assisted by diversification creates pressure for more commercial space which can lead to commercial invasion into the elite areas. The displaced elite then move to the new suburbs. Some of the elite central areas are left to middle class populations willing to upgrade to the older but perhaps better maintained housing.

During Stage VII a further change in residential segregation will occur as a spatial pattern of socioeconomic status similar to the sectoral pattern of larger Canadian cities will begin to emerge. This transition is at least in part a function of community size and will be related to both the perception of the community and the commitment of its residents.

VII. SINGLE-ENTERPRISE COMMUNITIES: A REVISED MODEL OF DEVELOPMENT

A. INTRODUCTION

In this thesis an intuitively based model of community growth and development was examined in an effort to determine if single-enterprise communities are similar, as implied by prior research or if identifiable stages occur in the development of these communities which manifest themselves in distinctive economic, demographic and social characteristics.

Utilizing the communities of Yellowknife and Whitehorse as analogous natural cases, the history of these communities was traced. Data from the Census of Canada were compiled and analyzed to determine if seven developmental stages occurred in the growth of these communities. When data were unavailable for the developmental stage, data from two single-enterprise communities in the exploitation ecumene served as proxies. This was necessary because only quinquennial data were available from the Censuses.

In the search for development stages with distinctive economic, demographic and social characteristics some shortcomings of this approach were evident. The frequency of Censuses resulted in data not being available for several stages in the development of the two communities being studied. The small size of these communities made data accessible only by enumeration area, which required

manipulation of random rounded information. The use of newer communities would have alleviated this problem to some degree. A data source with more frequent measurement would have provided better time series data for analysis.

The thesis could have been more analytic had the research concentrated on only one of the three aspects of the model. The examination of the economic, demographic and social characteristics limited the amount of time which could be devoted to each of the three aspects of the model. The censal indicators chosen to provide a broad indication of community development could have been limited to primary indicators at the outset. The use of study communities which had developed over a shorter time frame would have provided more comparable information from the Censuses.

The most significant finding of this research is that variable economic, demographic and social characteristics are evident in development stages. Although this research did not support Riffel's seven stages, at least four distinctive stages were documented.

Economically there was a transition from an almost total dependence upon hunting, fishing and trapping to a broader based economy with a service sector emphasis. In the case of Yellowknife approximately eighty per cent of the labour force was involved in the subsistence economy during the initial development stage. During the second stage, emphasis shifted to single-enterprise. The dependence of the community on single-enterprise employment is very high,

exceeding thirty per cent of the total labour force. In the early part of this stage, construction emerges as the single-enterprise dominating the local economy. Later in this stage, the single-enterprise (resource) upon which the community was founded dominates the economy. During the last two stages the economy diversifies and all sectors decline to less than thirty per cent of the total labour force employed in any single industry.

During the first stage of development, the population reflected demographic attributes similar to those characteristics of lesser developed countries. High fertility and shorter life expectancy generates a population pyramid with a broad base and an extremely low proportion of population aged sixty years of age and over. The second phase is typified by migrant populations with largely single male population and the balance of the population was comprised of young families in the early maturity stage. The population pyramid displays a pinched waist effect. Retirement aged population was very small, comprising less than three per cent of the total population. Migration and labour force turnover continued in Stages II and III. Very few people become permanent residents of the community during these stages. Only in the final stage (Stage IV) did mobility decline sufficiently resulting in at least fifty per cent of the population to be identified as non-movers.

During development the social change experienced by the native population was dramatic. The development of the

nuclear family, the institutionalization of many aspects of life, and the shift away from community interdependence resulted in a culture shock for the native population. This second stage of development resulted in an ecological order similar to that found in the pre-industrial city. Higher socioeconomic status groups, as measured by occupation and income, locate in the central areas close to schools, shopping and recreation facilities, while lower status groups settle in the periphery. As the community's economic structure diversifies, the third development stage exhibits suburbanization. The higher status populations located centrally in earlier stages, moved beyond the lower status groups leaving the central areas for conversion to commercial or multiple rental units.

B. RESEARCH FINDINGS

Despite shortcomings in the data and problems in gaining access to some information, there appears to be sufficient evidence to support the existence of stages in development and each stage can be characterized by unique economic, demographic and social characteristics. Unfortunately this thesis does not support sequential development because of significant data gaps.

The model seems to be a reasonable approach to the analysis of growth and development in the exploitation ecumene of northern Canada. The model provides a framework which can be used to explain urban growth of

single-enterprise communities. In this particular case the stages of the model were developed with reference to the economic activity of these communities. From the data analysis in the economic, demographic and social chapters, a slightly different model seems to emerge. The economic, demographic and social characteristics do not appear to fit into the seven stages. It seems, therefore, most appropriate to collapse the stages when describing the different characteristics, recognizing that the demographic and social aspects of quality of life are closely related to the economic aspects of quality of life and manifest themselves in the social geography of the community.

An alternative to the seven stage development model proposed by Riffel would be the integration of Riffel's model into the four stage growth model of Canadian society as suggested by W.W. Rostow. This simpler model of societal growth is suggested on the assumption that growth and development of single-enterprise communities represents a microcosm of Canadian society, in which (several hundred) years of societal growth and development are compressed into a much shorter time frame.

Integrating Riffel's seven stage model into the four stages of societal evolution results in Stages I and II, *Natural or Pre-discovery* and *Prospecting to Survey*, being subsumed under the pre-industrial stage of Rostow's model. Renamed pre-town for our purposes. The industrial growth stage encompasses Stages III, IV and V, *Industrial and Town*

Construction, Industrial Operation and Community Improvement and *Industrial and Community Operation*. These stages seem to fall together naturally as the predominant ethic Rostow gives for this stage is production and these three stages in Riffel's model are clearly oriented toward production of the community's resource.

Rostow's mass consumption stage with emphasis on consumption and growth is equivalent to Riffel's *Community Diversification*, Stage VI. During Stage VI the community shifts from pure production to concern for growth in the basic economy. The *Post-Industrial Stage* can be compared to community maturity at which time the community has attained the same status as southern communities of a similar size.

The seven stages as identified by Riffel may be more useful for purposes of analyzing the labour force or the economic base of the community than providing a model which reflects the stages of economic, demographic and social change. Riffel may have fallen into a traditional shortcoming of many classification schemes, overlooking much of the urban character by over-emphasizing the simple economic differences. The demographic and social aspects of this model are much more complex than Riffel has suggested.

As indicated in Chapters 2 and 3, the information and analysis derived here may provide additional information which leads to model simplification or to substantiation of the model as proposed. Using an indicators approach the seven stage model was rejected but a simpler model is being

proposed.

Table 19 summarizes the revised stages of the development model and integrates within the model certain geographic characteristics not previously incorporated in the model. The model will now be described according to each of the four characteristics and the way they manifest themselves during each of the four stages of development.

C. ECONOMIC CHARACTERISTICS OF THE FOUR STAGE MODEL

The economic characteristics which are unique to the *Pre-Town stage* are inclusive of two sub-stages. These sub-stages are integrated because the traditional native economy persists during both of the sub-stages. The dominant employment sector of the economy is hunting, fishing and trapping accounting for more than eighty per cent of the labour force. The geology and physiography of the area set the stage for the potential future exploitation. The Prospecting to Survey sub-stage provides a signal that active industrialization may be imminent, but no capital has been committed to the area.

The *Industrialization Stage* of development starts when construction of the industrial plant begins. Large investments of capital, both human and monetary are committed to the industrial plant and the community will house the work force. The completion and operation of the industrial plant takes precedence over construction of the residential and commercial buildings in the town. The

TABLE 19
Summary of Revised Stages and Characteristics of Single-Enterprise Town Development

STAGE	ECONOMIC CHARACTERISTICS	DEMOGRAPHIC CHARACTERISTICS	SOCIAL CHARACTERISTICS	GEOGRAPHIC CHARACTERISTICS
<u>PRE-TOWN</u>	traditional subsistence economy, short term activity, prospecting in the area	high birth and death rates, low levels of migration, age-sex pyramid not unlike lesser developed countries	isolated, role differentiation limited, extended kinship pattern, unspecialized labour force, "Gemeinschaft" society	rural, no definite geographic location other than region, nomadic
<u>INDUSTRIALIZATION</u>	emphasis on industrial construction and operation, getting return from investment, provision of services secondary to industrial operations	high levels of migration, reduced death rates, youthful population, age-sex pyramid not unlike new towns, 20-30 per cent of population non-migrants	pressure from new migrants for "Gesellschaft", more specialization of labour force, emphasis on production, nuclear family introduced	urban, geographic location tied to single-enterprise organized much like pre-industrial city, high status groups near centre, stress and strain as old society and new society meet
<u>DIVERSIFICATION</u>	shift in emphasis from production to growth, diversification of economy through secondary employer	reduced fertility, signs of aging in population, 50 per cent of population non-migrants, sex ratio declines to about 110	emphasis on expansion of roles, increased occupational diversity, specialization, "Gesellschaft", relationships necessary because of size	suburbanization, growth creates pressure for elites to move away from central area beyond lower classes, some residential high status groups remain centrally located
<u>POST-INDUSTRIALIZATION</u>	diversified economic base, limited opportunity for expansion, economic base is similar to southern service centres of the same size	low death rates, controlled fertility, increase in older population, population growth dependent on migration, 70 per cent of population non-migrants	emphasis on technology and communications, cosmopolitan view, choice of lifestyles	sectoral pattern of segregation develops, multiple nuclei develop, similar to southern Canadian cities

emphasis during this stage is on production, and getting a return on invested capital. At the beginning of this stage the labour force will be dominated by construction workers, the proportions will vary depending on the type of project and the duration of the construction period. The labour force of the community early in this stage could be described as a community of single-enterprise, that enterprise being construction.

At some point during this stage, the industrial plant is completed, the majority of construction workers leave or move to residential and commercial construction jobs in the town. Production jobs in the single-enterprise now become the dominant employment type and the construction workers are replaced by an entirely different work force. Generally, this period will have a dominant single-enterprise representing more than thirty per cent of the labour force and a secondary employer, construction, will represent between ten and twenty per cent of the labour force. Once the remaining residential and commercial construction is completed, the construction industry will decline to a much smaller proportion of total employment. Emphasis is now centered on the exploitation of the resource.

During the *Diversification Stage*, called *Community Diversification* in Riffel's model, the emphasis shifts from production to growth. Growth is viewed in positive terms and the diversification of the economy is actively promoted. Employment dominated by the single-enterprise now declines

through the introduction of a secondary employer, in many cases government. The growth of this sector and many supporting industries results in a more even split of employment. The services sector will increase dramatically, often showing growth rates of over 100 per cent in employment.

The *Post-Industrialization Stage*, identified by Riffel as *Community Maturity*, is postulated to be the final stage of development. This stage, as yet not attained by the communities being studied, is characterized by a diversified economic base, with little opportunity for expansion. This stage will see the community achieve a status similar to southern communities of similar size. The major growth sector in the economy will be the wholesaling and manufacturing sectors.

D. DEMOGRAPHIC CHARACTERISTICS OF THE FOUR STAGE MODEL

The demographic changes which accompany development vary significantly from stage to stage and the implication of these changes should be recognized and planned for in the development of single-enterprise communities. The *Pre-Town Stage* is typical of a very stable population, migration into the region is minimal as very few urban communities exist. The birth and death rates of this population are very high. The mortality rate is high because of the lack of modern medical facilities. Fertility remains high to ensure the survivorship of the family. This combination of vital events

results in an age-sex pyramid similar to that of less developed countries.

During the *Industrialization Stage* modern medical facilities are introduced and death rates are reduced through increased medical care. Migration levels are very high as construction workers and production workers enter the area. High labour turnover ensures that the population remains youthful. The labour turnover results in a very small proportion of stable population, as few as twenty per cent of the population being non-migrants. This continual turnover of population prevents the natural aging of the population. This process culminates in a unique age-sex pyramid through this stage, which resembles the age-sex distribution of migrants. This distribution has an over representation of 20-30 year old population. The sex ratio will vary substantially during this period but will generally start at a high level and decline through the period, being lowest at the end of the stage.

The *Diversification Stage* is characterized by reduced fertility, a core of stable residents establishes itself and approximately half of the population are non-migrants. The age-sex distribution now shows signs of an aging population. An infilling of population occurs in the 15-19 age group, reducing the pinched waist effect of the *Industrialization Stage*. The broad base of young children is reduced as are the population in the early maturity life cycle stage. The sex ratio shows further decline to about 110. Migration is

heavy as the diversification of the economy leads to increased job opportunities in the community. This migration stream is different from the stream of migrants during Stage II as this group of migrants are high in educational attainment and occupational status.

The *Post-Industrialization Stage* has reduced death rates due to more low risk jobs being available and further improvements in health care. Fertility is controlled as more options become available. A stable core of population, up to seventy per cent, are non-migrant and have a relatively high commitment to the community. The late maturity and retirement life cycle stages show the majority of population increase. The major proportion of population growth in the community is the result of migration.

E. SOCIAL CHARACTERISTICS OF THE FOUR STAGE MODEL

The social evolution of the single-enterprise community is summarized according to the four stages and reflects growth of the Canadian society. The *Pre-Town Stage* is typified by isolated native groups with limited economic role differentiation. This kinship pattern has a family unit which includes parents and other relatives of the family depending on custom. The labour force is limited to hunting and fishing and occupational structure is very uniform. The society is perhaps best described by the concept of "Gemeinschaft" where a feeling of belonging to the group exists.

During the *Industrialization Stage* of development migrants from southern cities arrive with very different social expectations. These groups with higher levels of education and high technology occupations create stress by demanding amenities and political structures. As the traditional social structure comes into contact with modern society culture shock is experienced by the Native population. (Morrison, 1977, 332-340) The introduction of the nuclear family and pressure for voluntary association because of mutual needs rather than group belonging generates friction in the community.

The *Diversification Stage* will emphasize the expansion of economic roles through increased occupational diversity and labour force specialization. "Gesellschaft" relationships will be necessary because of the expanded population size of the community.

The *Post-Industrialization Stage* introduces a cosmopolitan view of society with a wider choice of lifestyles. During this stage, emphasis will shift to communication and technology. Communication with metropolitan centres of business and culture will be central to the functioning of the community.

F. GEOGRAPHIC CHARACTERISTICS OF THE FOUR STAGE MODEL

Although geographic characteristics of development were not previously addressed there are a number of geographic characteristics which should be integrated into the model.

Rather than a catch-all statement that single-enterprise communities occur at the site of natural resource exploitation thereby lending a unique pattern to settlement in the Canadian north it can be stated that, each stage of development imposes a new pattern of residential organization on the community.

The *Pre-Town Stage* of development is characteristic of a rural nomadic society. Migrating as the game moves indigenous populations build temporary shelter in areas where hunting, fishing and trapping provide sufficient food for the immediate future.

The *Industrialization Stage* of development is a shift to an urban settlement form. This settlement will be tied to a specific location normally at or near the site of resource exploitation. As stated in Chapter 4, the residential pattern established during this stage is very similar to the pre-industrial city where the high status groups occupied areas adjacent to the central area. This pattern develops because the community services are located centrally and the elites having first choice of location, prefer easy access to the community recreation and shopping area.

The *Diversification Stage* is typical of suburbanization. The expansion of the economy generates pressures for an expansion of the central core area. This pressure increases land values in the central area and the high status groups relinquish their central location for substantive gain. These displaced high status groups now

move out beyond the lower class periphery, resulting in a reversal of the pattern which existed during Stage II. The extent of economic growth during this stage will dictate the degree of suburbanization and the degree of high status residual near the central core.

The *Post-Industrialization Stage* will result in a sectoral pattern of social segregation similar to larger southern Canadian cities. The increase in population and the required level of services will result in a multiple nuclei pattern with decentralization of retail and service establishments.

G. FUTURE RESEARCH

Modelling single-enterprise community development is still in the initial phases. Riffel conceptualized the first model of such development. In any modelling process the next step must be simplification of the Model. As part of this modelling process this research has reduced the number of development stages to four. Future research must attempt to mathematize the simplified model and search for the relationships between economic, demographic, social and geographic phenomena.

Substantive improvements in the model are possible through the collection of longitudinal data on single-enterprise communities during development. This would eliminate the need for the use of proxy communities. The comparison of new towns with single-enterprise communities

could be developed into a major research effort as demographic similarities are evident from the comparison with Millwoods.

Single-enterprise community development requires further study in relation to the demographic characteristics of the stages. The Demographic Transition Model could also be related to the development of single-enterprise communities.

The unique characteristics of the various stages points toward the need for a more interdisciplinary approach to research since the cause and effect of economic, demographic, social and geographic phenomena appear to be very closely tied. This type of approach would seem to be a better framework for the study of urban geography since it allows for the dynamic nature of urban places and recognizes that urban areas regardless of size are a system of inter-related components which are interconnected but each of these parts is a system unto itself. In the revised model, is an implicit recognition that changes occur as urban places grow and develop into larger systems. Recognizing that the economic, demographic, social and geographic parts each represent a system within the overall system.

Although the model provides a framework for simplifying and keeping track of the complex interrelationships within the urban system it must be remembered that it works for these specific cases and may not be representative of the development process in other single-enterprise communities.

In order to establish whether the model is effective in predicting the development process in all single-enterprise communities, a more comprehensive study of the 200 single-enterprise communities in Canada could be undertaken. (Siemens, 1973, 2).

Not only will future research require that more communities be studied, but more sophisticated analytic techniques will have to be used to establish if the process of development in stages is in fact valid. The model will require that each stage be tested and verified to establish the utility of the four stage model.

VIII. BIBLIOGRAPHY

ADVISORY COMMISSION ON THE DEVELOPMENT OF GOVERNMENT IN THE NORTHWEST TERRITORIES

- 1966 "Yellowknife" Settlements of the Northwest
Territories, pp. 203-254.

ALBERTA MUNICIPAL AFFAIRS

- 1976 New Town of Fort McMurray 1976 Municipal Census,
Edmonton: Municipal Affairs.

ALBERTA MUNICIPAL AFFAIRS

- 1977 New Town of Fort McMurray 1977 Municipal Census,
Edmonton: Municipal Affairs.

ALBERTA MUNICIPAL AFFAIRS

- 1978 New Town of Fort McMurray 1978 Municipal Census,
Edmonton: Municipal Affairs.

ALLEN, James B.

- 1966 The Company Town in the American West, Norman:
University of Oklahoma Press.

BERRY, B.J.L.

- 1964 "Approaches to Regional Analysis: A Synthesis."
Annals of the Association of American Geographers,
54, pp. 2-11.

BOURNE, L.S.

- 1963 The Urban and Regional Economy of Yellowknife,
N.W.T., M.A. Thesis, Department of Geography,
University of Alberta.

BOWMAN, Isaiah

- 1931 The Pioneer Fringe, Special Publication No. 13, New
York: American Geographical Society.

CANADA DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN
DEVELOPMENT

1968 Yukon Today: A Reference Paper, Ottawa: Queen's
Printer.

CARTER, H.

1972 The Study of Urban Geography. London: Edward Arnold.

CHORLEY, R.J.

1964 "Geography and Analog Theory," Spatial Analysis.
Berry B. and Marble D. Editors. Englewood Cliffs:
Prentice-Hall, pp. 35-52.

CHORLEY and HAGGETT

1967 Models in Geography. London: Methuen. Chapter 1.

CITY of Grande Prairie

1974 General Plan, Edmonton: Stanley Associates
Engineering Ltd.

CLEGG, E.T.

1958 A Regional Planning Analysis of a Single Enterprise
Community of Settlements, M.Sc. Thesis, Vancouver:
The University of British Columbia.

CLUNIE, David

1976 "Two New Northern Communities", New Communities in
Canada, Norm Pressman, Editor, Waterloo: Contact,
University of Waterloo, pp. 309-316.

CORTESE, L. and JONES, E.

1979 "Social Change in Boom Towns", Boom Towns and Human
Services, Jones E. et al, Editors, Cheyene:
University of Wyoming, pp. 1-12.

DAWSON, C.A. and MURCHIE, R.W.

1934 The Settlements of the Peace River Country: A Study
of a Pioneer Area, Canadian Frontiers of Settlements,
Vol. 6, Toronto: MacMillan.

DERBYSHIRE, E.

- 1960 "Notes in the Social Structure of a Canadian Pioneer Town", Sociological Review, Vol. 8, No. 1, pp. 63-75.

DOMINION BUREAU OF STATISTICS

- 1953 1951 Census of Canada, Volume 1, Population, General Characteristics, Ottawa: Queen's Printer.

DOMINION BUREAU OF STATISTICS

- 1957 1956 Census of Canada, Volume 1, Population, Counties and Subdivisions, Ottawa: Queen's Printer.

DOMINION BUREAU OF STATISTICS

- 1962 1961 Census of Canada, Volume 1, Population, General Characteristics, Ottawa: Queen's Printer.

DOMINION BUREAU OF STATISTICS

- 1969 1966 Census of Canada, Volume 1, Population, General Characteristics, Ottawa: Queen's Printer.

DOYLE, G.

- 1976 "A Preliminary Study of Expected Length of Stay in Three Northern Canadian Communities," in Studies of Expected and Effectuated Mobility in Selected Resource Frontier Communities. Winnipeg: University of Manitoba, pp. 13-95.

DUERDEN, Frank

- 1971 The Evolution and Nature of the Contemporary Settlement Patterns in a Selected Area of the Yukon Territory, Center for Settlement Studies, Winnipeg: University of Manitoba.

FAIRFIELD, Robert C.

- 1967 "New Towns in the Far North", Journal of Canadian Studies, Vol. 2, No. 2, pp. 18-26.

FRIED, J.

- 1962 Yellowknife, A sociological study, unpublished manuscript, Northern Co-ordination and Research Centre, Ottawa: Department of Northern Affairs and National Resources.

FRIED, J.

- 1963 "White-dominant Settlements in the Canadian Northwest Territories", Anthropologica, Vol. 5, No. 1, pp. 57-67.

FORT McMURRAY PLANNING TEAM

- 1979 New Town of Fort McMurray 1979 Municipal Census, Fort McMurray: New Town of Fort McMurray.

FORT McMURRAY PLANNING TEAM

- 1980 New Town of Fort McMurray 1980 Municipal Census, Fort McMurray: New Town of Fort McMurray.

GADJA, R.T.

- 1960 "The Canadian Ecumene - Inhabited and Uninhabited Areas." Geographical Bulletin #15, pp. 5-18.

GARTRELL, J.W. *et al*

- 1980 A Study of Human Adjustment in Fort McMurray. AOSERP Report 112, Edmonton: Government of Alberta.

GAUTHIER, P.G.

- 1949 "New Industrial Townsites", Canadian Mining Journal, Vol. XX, pp. 77-78.

GERTLER, Len and CROWLEY, Ron

- 1977 Changing Canadian Cities: The Next 25 Years. Toronto: McClelland and Stewart. pp. 250-267.

GHERSON, Joan

- 1968 "Analysis of Statistics and Statistical Needs of the Yukon Territory", The Yukon Economy: its potential for growth and continuity, Vol. 1-4, Ottawa: Queen's Printer.

HAMELIN, L.E.

- 1966 "Typologie de l'ecoumene Canadien," Memoires de la Societe Royal du Canada, Section 1, Serie Tome IV.

HAMELIN, L.E.

- 1978 Canadian Nordicity. Montreal: Harvest House Ltd.

HAMILTON, Walter R.

- 1964 The Yukon Story, Vancouver: Mitchell Press Ltd.

HANSEN, Jens Christian

- 1977 "The One Company Town in Norway - Can we learn from the recent past in planning for the future?" Paper presented at the 4th International seminar on Marginal Regions: "The effects of rapid industrial change and activity on sparsely populated areas." Duncraig Castle, Scotland.

HENDERSON, D.W.

- 1974 Social Indicators: A Rationale and Research Framework. Ottawa: Economic Council of Canada.

HUTTON, E.H.

- 1953 "The Roles of Models in Physics," British Journal of Philosophy Science, 4, pp. 284-301.

INSTITUTE OF LOCAL GOVERNMENT

- 1953 Single-Enterprise Communities in Canada. A Report to Central Mortgage and Housing. Ottawa: Queen's University.

JACOBSEN, George

- 1968 "Canada's Northern Communities", North, Vol. 15, pp. 34-37.

JACKSON, J. and POUSHINSKY N.

- 1976 Migration into Northern Mining Communities: Structural and Social Psychological Dimensions. Winnipeg: University of Manitoba.

KALBACH, W.E. and McVEY, W.W.

- 1971 The Demographic Bases of Canadian Society, Toronto: McGraw-Hill Company of Canada.

KAPLAN, A.

- 1964 The Conduct of Inquiry. San Francisco.

KERRI, James N.

- 1970 Fort McMurray: One of Canada's Resource Frontier Towns, Unpublished M.A. Thesis, Winnipeg: University of Manitoba.

KNIGHT, Rolt

- 1975 Work Camps and Company Towns in Canada and the U.S.: An Annotated Bibliography. Vancouver: New Star Books.

KOROSCIL, Paul Michael

- 1970 The Changing Landscape of the Yukon Territory and the Settlement of Whitehorse. Doctor of Philosophy. Ann Arbor: University of Michigan.

KOROSCIL, Paul Michael

- 1975 "Urbanization in the Canadian North: Yellowknife, N.W.T.", Canadian Issues, Vol. 1, Waterloo: pp. 115-136.

KOROSCIL, Paul Michael

- 1978 "Planning and Development in Whitehorse, Yukon Territory", Plan Canada. Canadian Institute of Planners, pp. 30-46.

LAATSCH, William G.

- 1972 Yukon Mining Settlement: An Examination of Three Communities, Doctor of Philosophy. Edmonton: University of Alberta, Department of Geography.

LANSING, J. and KISH, L.D.

- 1957 "Family Life Cycle as an Independent Variable." American Sociological Review, Vol. 22, pp. 512-519.

LARSON, L.E.

- 1979 The Impact of Resource Development on Individual and Family Well Being, AOSERP, Project HE1.2.1.

LEMCO van GINKEL, Blanche

- 1976 "New Towns in the North", New Communities in Canada. Norm Pressman, Editor, Waterloo: Contact, University of Waterloo, pp. 298-309.

LOTZ, J.R.

- 1961 Whitehorse, Yukon Territories, Ottawa: Industrial Division, Dept. of Northern Affairs and National Resources.

LOTZ, J.R.

- 1965 "The Squatters of Whitehorse; A Study of the Problems of new Northern Settlements", Arctic, Vol. 18, No. 3, pp. 173-198.

LUCAS, Rex A.

- 1971 Minetown, Milltown, Railtown: Life in Canadian Communities of Single Industry, Toronto: University of Toronto Press.

MARSH, Leonard

- 1970 Communities in Canada, Toronto: McClelland and Stewart Ltd. pp. 16-24.

MARTIN, F.

- 1969 "La Theorie de la Croissance Urbaine par Etape." Developpement Urbain et Analyse Economique. Paris: Cujas.

MATTHIASSEN, J.S. and KERRI, James N.

- 1971 Two Studies on Fort McMurray, Center for Settlement Studies, Winnipeg: University of Manitoba.

McCANN, L.D.

- 1978 "The Changing Internal Structure of Canadian Resource Towns", Plan Canada, Canadian Institute of Planners: pp 46-58.

McVEY, Wayne W.

- 1978 "Migration and the Smaller Community", Canadian Studies in Population, Vol. 5, pp. 13-23.

Mac DOUGALL, J.B.

- 1946 Two Thousand Miles of Gold, From Val d'Or to Yellowknife, Toronto: McClelland and Stewart.

MacMILLAN, J.A. et al

- 1974 Determinants of Labour Turnover in Canadian Mining Communities. Center for Settlement Studies, University of Manitoba, Winnipeg.

MEADOWS, P.

- 1957 "Models, System and Science," American Sociological Review 22, pp. 3-9.

MORRISON, R.B.

- 1977 Stress and Socio-Cultural Change in a New Town. Ph.D. Thesis, Department of Anthropology, Edmonton: University of Alberta.

MURPHY, R.

- 1966 The American City: An Urban Geography. New York: McGraw-Hill.

MYRDAL, G.

- 1957 Rich Lands and Poor. New York: Harper and Row.

NICKELS, Jones B. (editor)

- 1976 Studies of Expected and Effectuated Mobility in Selected Resource Frontier Communities, Center for Settlement Studies, Winnipeg: University of Manitoba.

NICKELS, J.B. and LEDGER, J.

- 1976 Winter Wilderness and Womanhood: Explanation or Excuses for Mental Health Problems, Center for Settlement Studies, Winnipeg: University of Manitoba.

NICKELS, J. B. et al

- 1976 Life Satisfaction in a Resource Frontier Community, Center for Settlement Studies, Winnipeg: University of Manitoba.

PAGE, J.E. and CARVALMO, M.E.

- 1973 Habitability in the Boreal Zone of Canada. Pilot Study: East-Man Manitoba, Winnipeg: Center for Settlement Studies, University of Manitoba.

PARKER, Victor J.

- 1950 The Planned Non-Permanent Community: An Approach to Development of New Towns Based on Mining Activity. M.Sc. Thesis, Vancouver: University of British Columbia.

PEACE RIVER REGIONAL PLANNING COMMISSION

- 1971 Central Places in the Peace River Region of Alberta, Grande Prairie: Peace River Regional Planning Commission.

PEARSON, N.

- 1966 "New Towns in Alberta". Town and Country Planning, Vol. 34, No. 10, pp. 473-477.

PORTEOUS, J.D.

- 1970 "The Nature of the Company Town", Institute of British Geographers Transactions, No. 51, pp. 127-142.

PORTEOUS, J.D.

- 1976 "Quality of Life in British Columbia Company Towns: Resident Attitudes." New Communities in Canada, Norm Pressman, Editor, Waterloo: Contact, University of Waterloo, pp. 332-349.

PRESSMAN, N.

- 1974 Planning New Communities in Canada, Waterloo: Contact, University of Waterloo.

PRICE, Ray

- 1967 Yellowknife, Toronto: Peter Martin Associates.

PUTNAM, D. and PUTNAM J.

- 1970 Canada: A Regional Analysis, Toronto: J. Dent and Sons, pp. 1-10.

RAE, G.W.

- 1964 "Settlement of the Great Slave Lake Frontier", Unpublished Ph.D. Thesis, Ann Arbor: University of Michigan.

RAY, Michael D.

- 1971 Dimensions of Canadian Regionalism, Ottawa: Department of Energy, Mines and Resources.

REGENSTREIF, A.

- 1977 "Leaf Rapids, Manitoba. A Case Study in Planning for a Contemporary Resource Based Community", Presented to: Canadian Association for American Studies, Hamilton: McMaster University.

RICHARDSON, N.

- 1963 "Tale of Two Cities." Plan Canada, No. 3, Canadian Institute of Planners, pp. 110-125.

RIDGE, F.G.

- 1953 "General Principles for Planning Sub-Arctic Communities." Unpublished Ph.D. Thesis, McGill University.

RIFFEL, J.A.

- 1975 Quality of Life in Resource Towns, Center for Settlement Studies, University of Manitoba. Ottawa: Ministry of State for Urban Affairs.

ROBINSON, Ira M.

- 1962 New Industrial Towns on Canada's Resource Frontier, Department of Geography, Research Paper No. 73, Chicago: Department of Geography, The University of Chicago.

ROBINSON, Ira M.

- 1963 "The Peace River Region". Regional and Resource Planning in Canada, eds. R.R. Krueger *et al*, Toronto: Holt, Rinehart and Winston, pp. 97-105.

ROSTOW, W.W.

- 1960 The Stages of Economic Growth, Cambridge: Cambridge University Press.

SCHOENAUER, Norbert

- 1976 "Fermont: A New Version of the Company Towns", New Communities in Canada, Norm Pressman, Editor, Waterloo: Contact, University of Waterloo, pp. 316-321.

SHAW, William G.A.

- 1970 Evaluations of Resource Towns: Planned and Unplanned, M.A. Thesis, Department of Geography, Edmonton: University of Alberta.

SHRYOCK, Henry S. and SIEGEL, Jacob S.

- 1971 Methods and Materials of Demography, Vol. 1, Washington, D.C.: U.S. Census Bureau.

SIEMENS, L.B.

- 1973 Single-Enterprise Community Studies in Northern Canada, Center for Settlement Studies, Winnipeg: University of Manitoba.

SKILLING, H.

- 1964 "An Operational View." American Scientist, 52, pp. 338A-396A.

STATISTICS CANADA

- 1972 1971 Census of Canada, Volume 1, Population, General Characteristics, Ottawa: Queen's Printer.

STATISTICS CANADA

- 1977 1976 Census of Canada, Volume 1, Population, Geographic Distributions, Census Divisions and Subdivisions, Ottawa: Queen's Printer.

STAVELY, M.

- 1966 "The Population Geography of Yellowknife, Northwest Territories", Albertan Geographer (2), Edmonton: Dept. of Geography, University of Alberta, pp. 12-24.

STONE, Leroy O.

- 1967 Urban Development in Canada: An Introduction to the Demographic Aspects. Dominion Bureau of Statistics, Ottawa: Queen's Printer.

SUPPES, P.

- 1962 "Models of data," In Nagel *et al* Logic, Methodology and Philosophy of Science. Stanford pp. 252-261.

TAYLOR, Griffith

- 1951 "Mining Towns", Urban Geography, London: Meuthuen Co. Ltd., pp. 301-323.

THEOBALD, D.W.

- 1964 "Models and Methods," Philosophy, 39, 260-267.

THOMLINSON, R.

- 1969 Urban Structure, New York: Random House Inc.

TIEBOUT, C.M.

- 1956 "Exports and Regional Economic Growth," Journal of Political Economy, 64(2), pp. 160-169.

WATSON, J.W.

- 1954 "The Pattern of Canada's Post-War Growth." Geography, XXXIX, pp. 163-169.

WEIR, D.A.

- 1967 A Study of Three Northern Settlements; Fort Norman, Fort Franklin, and Norman Wells, N.W.T., M.A. Thesis, Dept. of Geography, Edmonton: University of Alberta.

WILSON, M.G.

- 1962 "Some Population Characteristics of Australian Mining Communities". T.E.S.G., Vol. 53, No. 5, pp. 125-132.

WIRZ, H.M.

1975 Social Aspects of Planning in New Towns. London:
Saxon House and Lexington Books, pp. 1-51.

APPENDIX

TABLE 20
Selected Social Statistics, Fort McMurray, 1971

Enumeration Area Number	Total %	Managerial Professional and Technical %	Clerical Sales and Service %	Processing and Related %	Transportation and Communication %	All Other Occupations %	Average Income \$
161	100.0	10.5	42.1	21.1	5.3	21.0	2,821
162	100.0	10.8	35.1	18.9	5.4	29.8	4,372
163	100.0	12.5	37.1	32.1	0.0	18.3	5,129
164	100.0	29.5	24.6	14.8	3.3	27.8	5,977
165	100.0	17.1	39.0	17.1	2.4	24.4	3,284
166	100.0	11.9	22.0	27.1	3.4	35.6	3,651
167	100.0	20.0	23.1	16.9	1.5	38.5	3,498
168	100.0	17.9	29.9	26.9	5.2	20.1	4,166

TABLE 21.
Selected Social Statistics, Grande Cache, 1971

Enumeration Area Number	Total %	Managerial Professional and Technical %	Clerical Sales and Service %	Processing and Related %	Transportation and Communication %	All Other Occupations %	Average Income \$
318	100.0	11.8	29.4	21.6	9.8	27.4	4,097
319	100.0	9.5	27.0	21.6	1.4	40.5	4,292
320	100.0	10.6	27.7	8.5	2.1	51.1	3,249
321	100.0	19.6	26.1	21.7	2.2	30.4	3,716

TABLE 22
Selected Social Statistics, Yellowknife, 1971

Enumeration Area Number	Total %	Managerial Professional and Technical %	Transportation and Communication %	All Other Occupations %	Average Income \$
60	100.0	14.3	14.3	71.4	5,256
61	100.0	20.0	18.8	61.2	5,491
62	100.0	29.8	8.8	61.4	6,259
63	100.0	20.6	22.2	57.2	5,060
64	100.0	10.3	15.4	74.3	3,075
65	100.0	10.3	13.8	75.9	5,854
66	100.0	8.9	20.0	71.1	4,855
67	100.0	16.0	12.0	72.0	4,876
68	100.0	10.7	23.2	66.1	4,892
69	100.0	28.2	13.8	57.0	6,097
70	100.0	32.1	11.5	56.4	6,135

TABLE 23
Selected Social Statistics, Whitehorse, 1971

Enumeration Area Number	Total %	Managerial, Professional, and Technical %	All Other Occupations %	Average Income \$
7	100.0	3.8	96.2	5,231
8	100.0	7.4	92.6	3,283
9	100.0	2.9	97.1	4,781
10	100.0	17.9	82.1	5,410
12	100.0	28.2	71.8	6,362
13	100.0	27.3	72.7	6,565
15	100.0	13.2	86.8	5,580
16	100.0	15.0	85.0	5,498
17	100.0	17.1	82.9	5,531
18	100.0	5.3	94.7	4,717
19	100.0	17.6	82.4	6,070
20	100.0	11.5	88.5	4,932
21	100.0	13.0	87.0	5,808
23	100.0	29.0	71.0	5,563
24	100.0	12.1	87.9	5,044
25	100.0	26.8	73.2	7,065
26	100.0	19.4	80.6	5,556
27	100.0	8.8	91.2	5,983
28	100.0	4.2	95.8	5,650
29	100.0	3.3	96.7	4,946